

FEDERAL ELECTRONIC IMAGING MARKET

1991 - 1996

INPUT

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**Federal Information Systems and Services
Program (FISSP)**

Federal Electronic Imaging Market, 1991-1996

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Abstract

This report examines the federal electronic imaging market. It identifies the federal agencies' requirements and the application areas supported by existing and planned imaging systems.

INPUT believes that the federal imaging market will grow from \$430 million in FY 1991 to \$1.42 billion in FY 1996, at a compound annual growth rate of 27%. In addition to the market forecast, this report describes the major market issues and trends impacting the industry.

This report contains 88 pages, including 40 exhibits.

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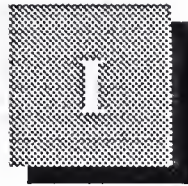
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Introduction

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The federal government receives, stores and processes massive amounts of paper daily. Maintaining the resulting paper files is costly and burdensome. In order to deal with these billions of documents, many agencies are turning to electronic imaging systems.

As part of INPUT's Federal Information Systems and Services Program, this report addresses the growing need to develop electronic imaging systems to store and retrieve original documents. The purpose of this report is to assist federal contractors in analyzing the current and future federal imaging market.

The report's findings are based on research and analyses of several sources:

- INPUT's Procurement Analysis Reports (PARs)
- OMB/GSA/NBS Five-Year Information Technology Plans for 1991-1996
- Interviews with random federal agencies, many with active or planned imaging system acquisitions
- Federal agency FY 1990 and FY 1991 information technology budgets
- OMB's Five-Year Plan for Meeting the ADP and Telecommunications Needs of the Federal Government
- INPUT's report, Electronic Imaging Market, 1990-1995

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A

Purpose and Scope

With continuance of the paper explosion, organizations are looking increasingly for alternatives to the current labor-intensive methods of storing and retrieving documents. With viable alternatives becoming increasingly available, federal agencies are beginning to consider alternatives to manual filing, microfiche, and microfilm as methods of document storage.

The purposes of this report are to assess the federal market for electronic imaging and to identify opportunities for federal vendors.

This report addresses a number of issues, such as the following:

- To what extent do standards exist and how are they affecting the federal market?
- What is driving the growing agency demand for imaging? What is the appeal?
- Is the controversy over document images being legal substitutes affecting the federal imaging marketplace?
- Do certain applications dominate the market? What are they? Are they likely to change?
- Is the growing popularity of imaging causing a reduction of activity in paper-related technologies?
- Who are the leading vendors?
- What strategies are required to succeed in the market?

B

Methodology

In developing this report, INPUT used a variety of sources and methods. First, INPUT researched agency long-range plans and budget submissions for FY 1991-FY 1996 for major systems replacements and new acquisitions. Based on this research, INPUT pinpointed agencies and programs that related to imaging systems.

INPUT also reviewed the Procurement Analysis Reports (PARs) to develop further insights into agency activities. Many PARs cover programs that, for one reason or another, do not appear in the agencies' budget submissions. The situation yields additional possibilities for further research.

Other data for the report was derived from primary and secondary research.

- Primary data was collected from agency officials through a questionnaire developed by INPUT to acquire information about current experiences and future plans for imaging systems (Appendix F).
- Secondary data was used to develop an understanding of the types of hardware and software available and to assess trends in technology development.

C

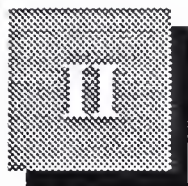
Report Organization

In addition to the introduction and appendixes, this report consists of four chapters:

- Chapter II contains an executive overview describing the major points and findings in the report.
- Chapter III provides the market forecast and analysis which describe the major market issues and trends impacting the industry.
- Chapter IV summarizes the federal agencies' requirements for imaging systems and the application areas supported by existing and planned systems.
- Chapter V provides a sample of business opportunities for programs and initiatives in the federal market involving imaging systems.

The following appendixes are also provided:

- Interview Profiles
- Definitions
- Glossary of Federal Acronyms
- Policies, Regulations, and Standards
- Related INPUT Reports
- Agency/User Questionnaire



Executive Overview

A

Technology Description

Electronic imaging systems are gaining more momentum in the federal government market due to the large volumes of paper generated, received, processed, and stored by government agencies. Manipulating, storing, and tracking billions of paper documents are extremely cumbersome. Thus, many agencies have turned to electronic imaging to make records management and document processing more efficient and less time consuming.

Electronic imaging refers to raster image files, rather than ASCII text or vector graphics, which can be processed and stored by a computer. Raster images are typically entered into a computer system through the use of a scanner or camera. These images are stored as pixels, displayed as dots on a screen, providing a "picture" of the paper document; whereas ASCII converts letters, numbers, and symbols into a binary form for indexing.

Imaging systems consist of the components listed in Exhibit II-1.

EXHIBIT II-1

Imaging System Components

- Input/output devices
- Processing unit
- Software
- Storage devices

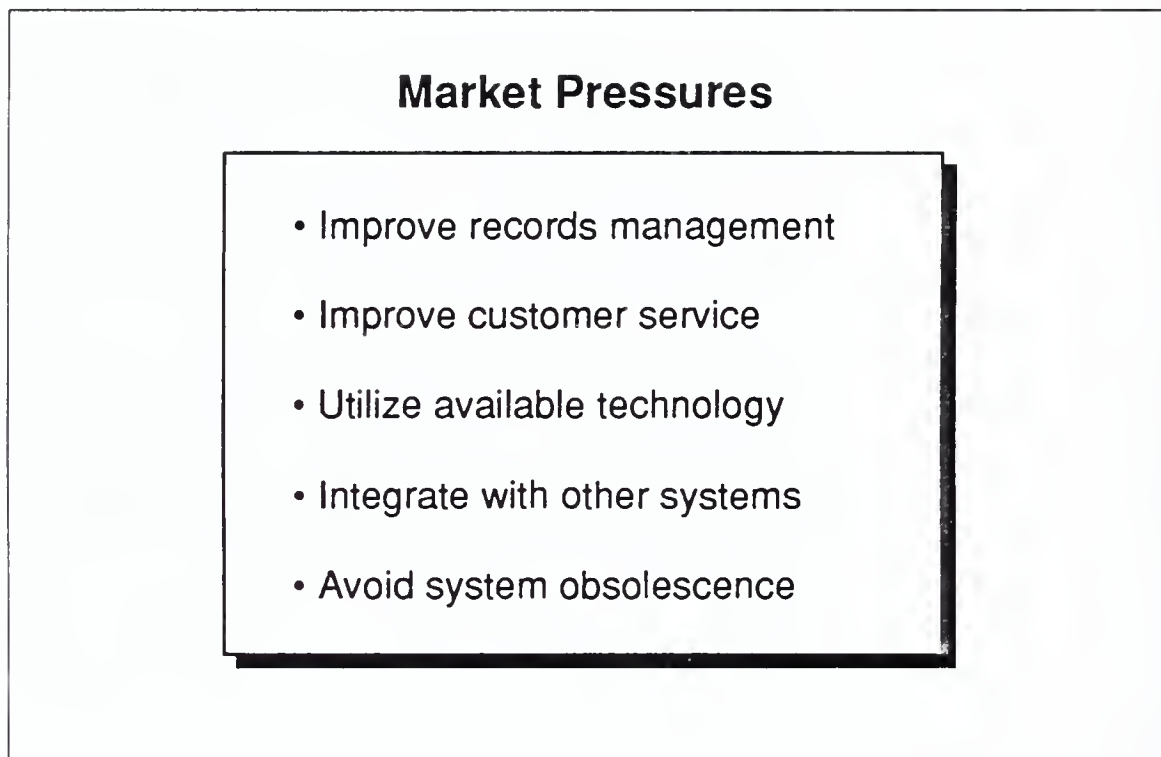
Input and output devices include scanners, cameras, printers, and display terminals. Processing units can range from microcomputers to supercomputers. Software is needed to manage, index, and manipulate the images on the system. Image storage devices use either optical media, magnetic media, or a combination of both.

B

Federal Market Pressures

The federal market for electronic imaging systems and equipment is expected to grow rapidly over the next five years. Some of the pressures impacting this growth are listed in Exhibit II-2. Government programs require constant improvement in both quality and quantity of information technology support.

EXHIBIT II-2



The federal government is under pressure to improve its records management and its customer service. Federal agencies process and store billions of documents, ranging from forms and memos to photographs and maps. Electronic imaging systems drastically reduce errors, made through manual filing, and decrease document processing time. This improves records management and customer service.

In order to accomplish the above goals, agencies must take advantage of the available imaging technology. Even though imaging is still a new and evolving technology, there is a wide variety of systems available today.

Agencies are also under pressure to implement imaging systems that can be integrated with existing or future imaging systems. Few universal standards exist in the imaging market at this point, but gains from imaging systems seem to outweigh foreseeable compatibility problems.

System obsolescence is always an issue, especially with an emerging technology. In order to lessen the impact of new technology, vendors should implement flexible, comprehensive systems—systems that can be upgraded to take advantage of new technology.

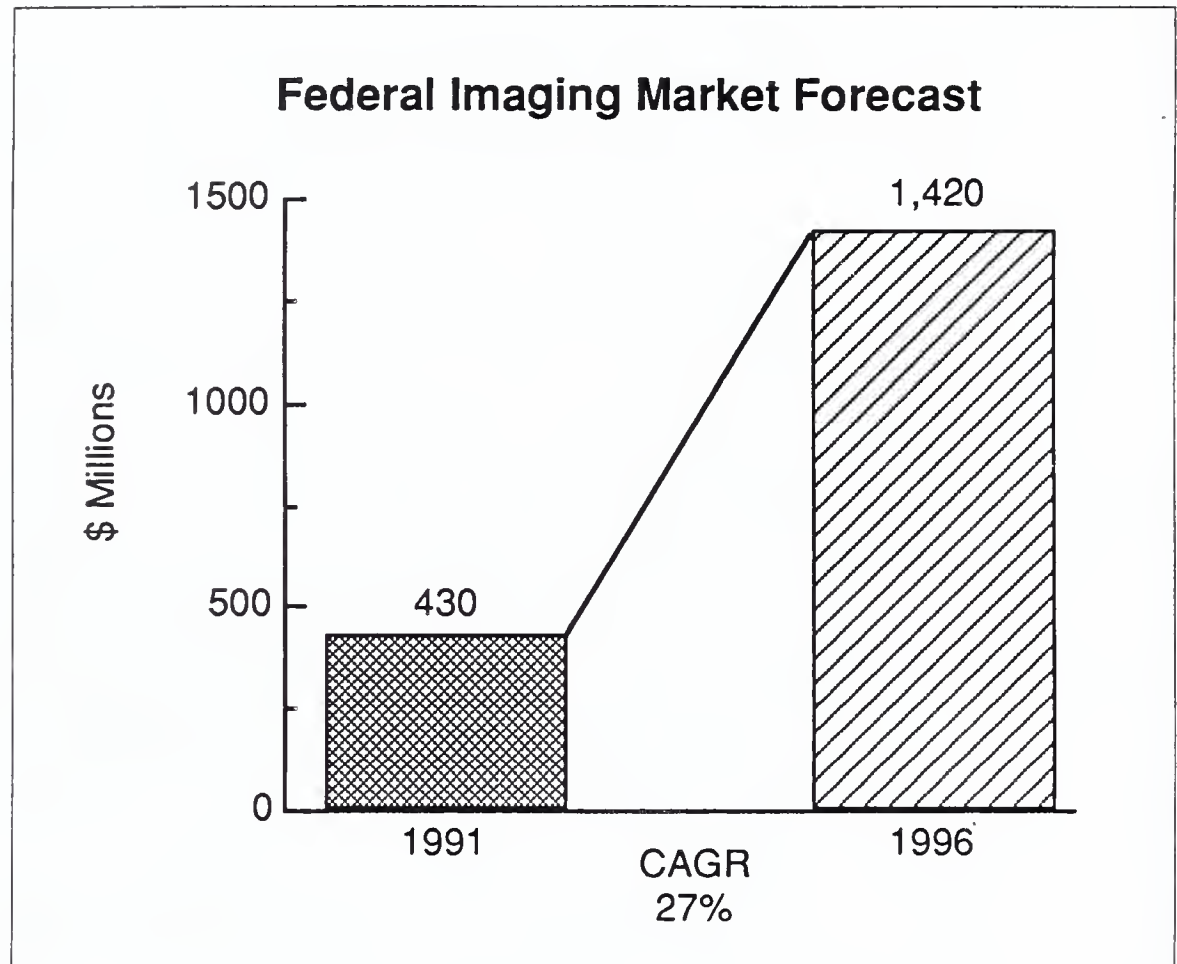
C

Market Forecast

As with emerging technology areas, such as geographic information systems and electronic data interchange, forecasting the federal imaging market presents a problem. Based on the research performed for this study, INPUT has concluded that there are dozens—possibly hundreds—of pilot projects in development. For the most part, agencies do not publicize these initiatives.

INPUT expects the federal market for imaging products and services to grow from \$430 million in FY 1991 to \$1.42 billion in FY 1996, at a compound annual growth rate (CAGR) of 27%. Exhibit II-3 shows this growth graphically. Given the paper-oriented nature of most federal processes, imaging presents a significant savings potential. This, in part, accounts for the high growth rate. Additionally, the growing availability and functionality of imaging products are also fostering market growth.

EXHIBIT II-3



D

Leading Vendors

Exhibit II-4 lists the top five imaging system vendors as perceived by agency respondents. The true leaders in the federal imaging market are extremely difficult to identify. INPUT's standard procedure of looking at contract awards to identify top vendors is virtually impossible to use for the following reasons:

- There is no standard SIC Code or Federal Product Code for imaging systems
- There is no standard title for imaging system contracts
- An imaging system may only be a piece of a larger procurement

A Filenet imaging system is currently in use at the House of Representatives, managing personnel and accounting records. Filenet uses an open architecture for its WorkFlo Business System software for Filenet UNIX workstations, AT-compatible, DEC, or Sun Microsystems, Inc. workstations.

EXHIBIT II-4

Leading Imaging Vendors

- Filenet
- IBM
- Wang
- TRW
- PRC

IBM offers two ImagePlus systems. One of these systems is currently installed at the EPA. One ImagePlus system is meant for enterprise-wide applications, while the other is suited to midrange needs. IBM also has a High Performance Transaction System for check processing.

TRW Financial Systems, Inc. won a \$5.5 million prototype contract in 1988 to build an image processing subsystem (IPSS) for the U.S. Postal Service. In 1989, TRW won a follow-on contract to develop a more advanced prototype.

PRC is known mostly for its imaging work at the Patent and Trademark Office for the Automated Patent System (APS). The Automated Patent System will eventually contain 15 million U.S. and foreign patents. At this point only 800,000 of these have been loaded onto optical devices for interactive retrieval. PRC's system is based on Sun Microsystems, Inc.'s workstations.

As previously mentioned, it is difficult to cite the leaders in the imaging market. Many systems integrators are recognized as leaders, such as PRC, McDonnell Douglas, DEC, etc., but these integrators use different products manufactured by companies such as Kodak, Sony, Intergraph, etc.

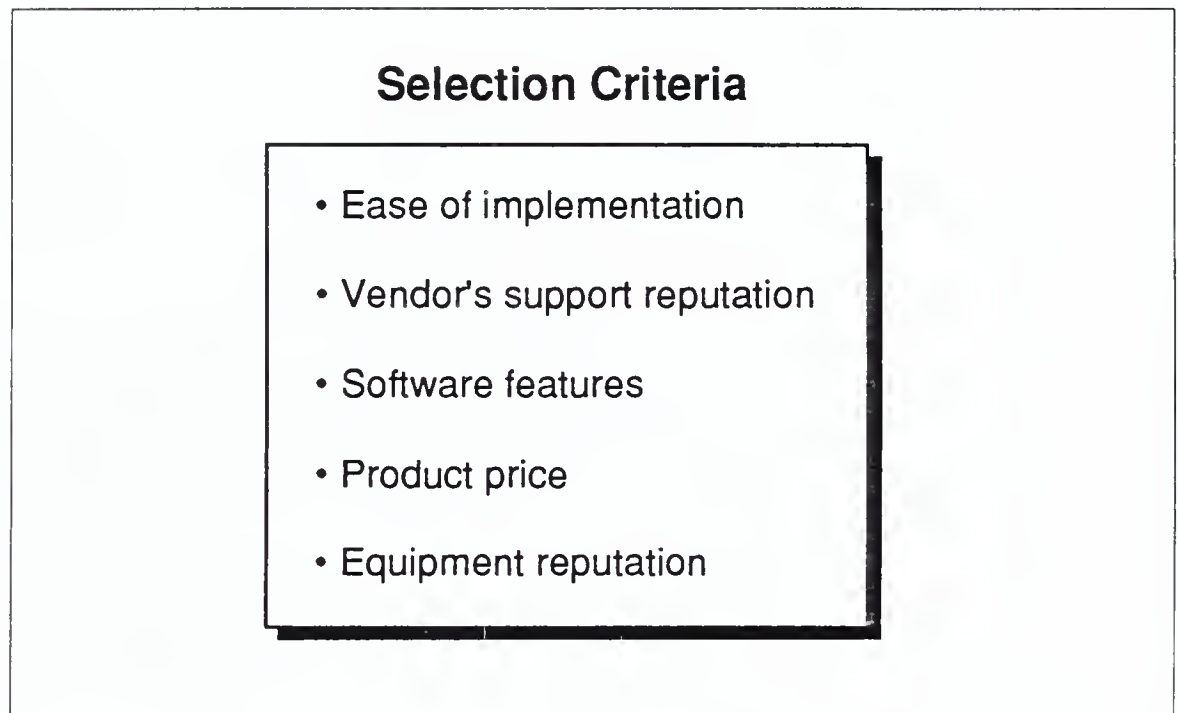
INPUT predicts systems integrators will continue to be the recognized leaders in the imaging market due to the magnitude of the systems they are contracted to implement, but companies with smaller LAN-based system solutions will also fare well in this market. Typically, the volume and the complexity of the images to be converted to electronic media will dictate the type and size of vendor chosen for the job. There is much room for growth in the federal imaging arena for integrators, manufacturers, service firms, and other vendors.

E

Selection Criteria

Exhibit II-5 lists the top selection criteria used by respondent agencies in evaluating imaging system purchases.

EXHIBIT II-5



Ease of implementation ranks highest among selection criteria. Agencies are looking for a smooth transition from their current system to an imaging system. Vendor assistance and involvement in the conversion stages of the project are essential.

Agencies will evaluate potential vendors on the criteria listed above. Vendors need to choose solutions and develop proposals that meet these criteria. Team building will be important for contractors lacking imaging experience.

F

Recommendations

In the federal imaging market, vendors need to adopt various strategies to succeed. INPUT's recommended strategies are set forth in Exhibit II-6.

Most vendors need to build strong supplier and support relationships to ensure availability of equipment and expertise. Imaging systems have different characteristics from information systems, and few vendors have the in-depth knowledge and access to the technology necessary for a complex imaging system.

EXHIBIT II-6

Recommendations

- Establish strong alliances
- Build strong agency relationships
- Incorporate technological advances
- Use standards

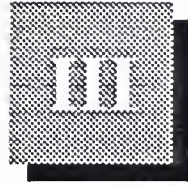
Alliances with teaming partners are also important. Agency respondents indicated that imaging experience is one of their selection criteria. Vendors with little or no imaging experience, but who have an established federal background, can use teaming relationships to enter the federal imaging arena.

Frequently, imaging system procurements lead to repeat purchase of individual pieces of equipment or additional systems. Establishing a strong relationship with an agency may increase a vendor's chance of repeat business within that agency. Quality service to the agency is one way to build a good reputation and relationship.

Studying and incorporating technological advances into a vendor's offering are extremely important in a young industry such as imaging. This approach will help the purchasing agency lessen system obsolescence. Also, allowing for upgrades of technology in the contract will make the system more desirable.

Although imaging standards are ill-defined, it is important for a vendor to include standards in the system offering. The trend for imaging standards within agencies is to use those standards being implemented by industry and the National Institute of Standards and Technology (NIST). Most agencies are moving towards GOSIP compliance and UNIX-based systems. Vendors' products should be flexible and not limited to one platform.

The federal electronic imaging industry is new and dynamic. As system costs decrease and the value of imaging becomes more recognized, an increasing number of agencies will see electronic imaging as a means of addressing a variety of problems.



Market Analysis and Forecast

A

Market Condition

Electronic imaging systems are gaining more momentum in the federal government market due to the large volumes of paper generated, received, processed, and stored by government agencies. Manipulating, storing, and tracking billions of paper documents are extremely cumbersome. Thus, many agencies have turned to electronic imaging to make records management and document processing more efficient and less time consuming.

Electronic imaging refers to raster image files, rather than ASCII text or vector graphics, which can be processed and stored by a computer. Raster images are typically entered into a computer system through the use of a scanner or camera. These images are stored as pixels, displayed as dots on a screen, providing a "picture" of the paper document. ASCII, on the other hand, converts letters, numbers, and symbols into a binary form for indexing.

The market for imaging systems and products is still in the introductory stage. Technology for these systems is still evolving. Most gains in imaging technology are being made in the area of storage.

For purposes of this report, image storage media are divided into optical and magnetic media. Optical media use light-generated impulses to represent data on a disk. Magnetic media use magnetic impulses to duplicate data on magnetic recording devices. Electronic imaging systems are composed of both optical and magnetic recording media.

Optical disks generally fall into two categories: read-only and read/write.

- Read-only disks are best represented by the CD ROM (compact disk read-only memory), an optical disk used for distribution of high-quality audio and video recordings. CD ROM can store a high volume of data, is durable, can be reproduced in great quantities, and is easily distributed.

- Once created, the CD ROM cannot be written on (without destroying existing data) and is an excellent means of distributing high-quality data such as product descriptions and specifications. CD ROMs are most applicable where there is a need to mass-distribute information.
- Read/write disks can be further divided into two categories: write-once and erasable. These types have received increasing attention as a means of addressing image storage and retrieval problems.
 - Write-once/read-many (WORM) disks are similar to CD ROMs. They are used in applications where there is a need to create a disk that will be read many times, but not rewritten. Data may not be added to these disks without destroying previously written data.
 - Erasable disks are used in situations where it is necessary to update previously recorded data or to reuse previously recorded disks.

The 1991 Association for Information and Image Management (AIIM) conference showed a shift in emphasis from WORM to erasable optical disks, multimedia drives, and new optical jukeboxes. INPUT predicts the storage densities of both magnetic and optical disks will at least double in the next five years.

Holographic memory is attracting new attention in the federal community and could revolutionize information storage. Holography involves storing information as a three-dimensional, laser-generated image—a hologram. Computer systems with a holographic memory have the potential to store at least ten times more information and retrieve it at speeds about 1,000 times faster than today's top computers. Bellcore Laboratories and Microelectronics and Computer Technology Corp. (MCC) are receiving funding from the government for separate prototypes and research in this area of information storage. Holographic storage devices would boost the imaging systems market by radically affecting storage methods and their efficiency.

Other technical advances are being made in the area of software, recognition devices, and input/output devices. As of this year, companies can purchase imaging systems without buying a collection of exotic hardware integrated by proprietary software. Software-only imaging products are now possible because of the widespread use of multitasking microprocessors, local-area networks (LANs), and graphical user interfaces.

Workflow is another key technology for the imaging industry. Workflow is a term for software that automatically moves digitized documents through an organization. This technology could eventually lead to integrated, enterprise-wide document distribution. Some vendors are working toward this ideal.

Advances are also being made in the area of recognition. The biggest bottleneck in most digital document systems occurs when the document is scanned and indexing information must be entered by hand. Bar codes and character recognition are two ways to speed up the indexing process. Handwriting recognition devices are also likely to appear in this area.

B

Market Pressures

Exhibit III-1 shows the pressures facing government agencies with regard to the electronic imaging market.

EXHIBIT III-1



The federal government is under pressure to improve its records management and its customer service. Federal agencies process and store billions of documents, ranging from forms and memos to photographs and maps. These massive amounts of paper are time- and labor-intensive to maintain. Many documents are often misplaced, lost, or misfiled due to human error. Electronic imaging systems drastically reduce errors normally made through manual filing, thus reducing the time it takes to retrieve documents. Records are indexed, stored, and maintained by imaging software, which greatly improves records management.

The improved records management leads to improved customer service. The term “agency customer” refers to anyone doing business or receiving output from that agency. Imaging systems decrease the time it takes an agency to process an application or find a document, thus improving service to the customer.

In order to accomplish the above goals, agencies must take advantage of the available imaging technology. Even though imaging is still a new and evolving technology, there is a wide variety of systems available today. These systems range from LAN-based two-color records management systems to high-end photographic quality mission planning and simulation systems. In order to make their agencies run more efficiently, many government IRM officials are under pressure to take advantage of the existing imaging technology. The only obstacle is funding.

Agencies are also under pressure to implement imaging systems that can be integrated with existing information systems or future systems. This is especially difficult due to the newness of the market and the technology. Few universal standards exist in the imaging market at this point. It will be hard for agencies to completely avoid compatibility problems while the imaging market and industry are still developing. However, this problem should not hinder agencies from implementing imaging systems. Gains from imaging systems seem to outweigh foreseeable compatibility problems.

System obsolescence is always an issue, especially with an emerging technology. Because technology changes daily, it is impossible to completely avoid system obsolescence. In order to lessen the impact of new technology, vendors should implement flexible, comprehensive systems—systems that can be upgraded to take advantage of new technology. Vendors should also consider developing contingency plans within contracts to allow for upgrades of the system as technology advances.

C

Market Forecast

As in other emerging technology areas, such as geographic information systems and electronic data interchange, forecasting the federal imaging market presents a problem. Based on the research performed for this study, INPUT has concluded that there are dozens, and possibly hundreds, of pilot projects under development. For the most part, agencies do not publicize these initiatives.

In a 1989 report, OMB identified 59 agency imaging programs, with values ranging from \$50 million in FY 1989 to \$285 million in FY 1992. OMB stated that spending would drop back to \$213 million in FY 1993. However, INPUT believes that this latter figure merely represents a lack of concrete spending plans for the out years.

In a separate 1989 report, OMB projected spending on imaging technology to range from \$100 million in FY 1989 to \$255 million in FY 1992, with a drop off to \$214 million in FY 1993. INPUT believes that these numbers significantly understate the market, since they are based on partial agency data and exclude small, pilot-type initiatives.

INPUT expects the federal market for imaging products and services to grow from \$430 million in FY 1991 to \$1.42 billion in FY 1996, at a compound annual growth rate (CAGR) of 27%. Exhibit III-2 presents this growth in a graphical fashion. Given the paper-oriented nature of most federal processes, imaging presents a significant savings potential. This, in part, accounts for the high growth rate. Additionally, the growing availability and functionality of imaging products are also fostering market growth.

EXHIBIT III-2

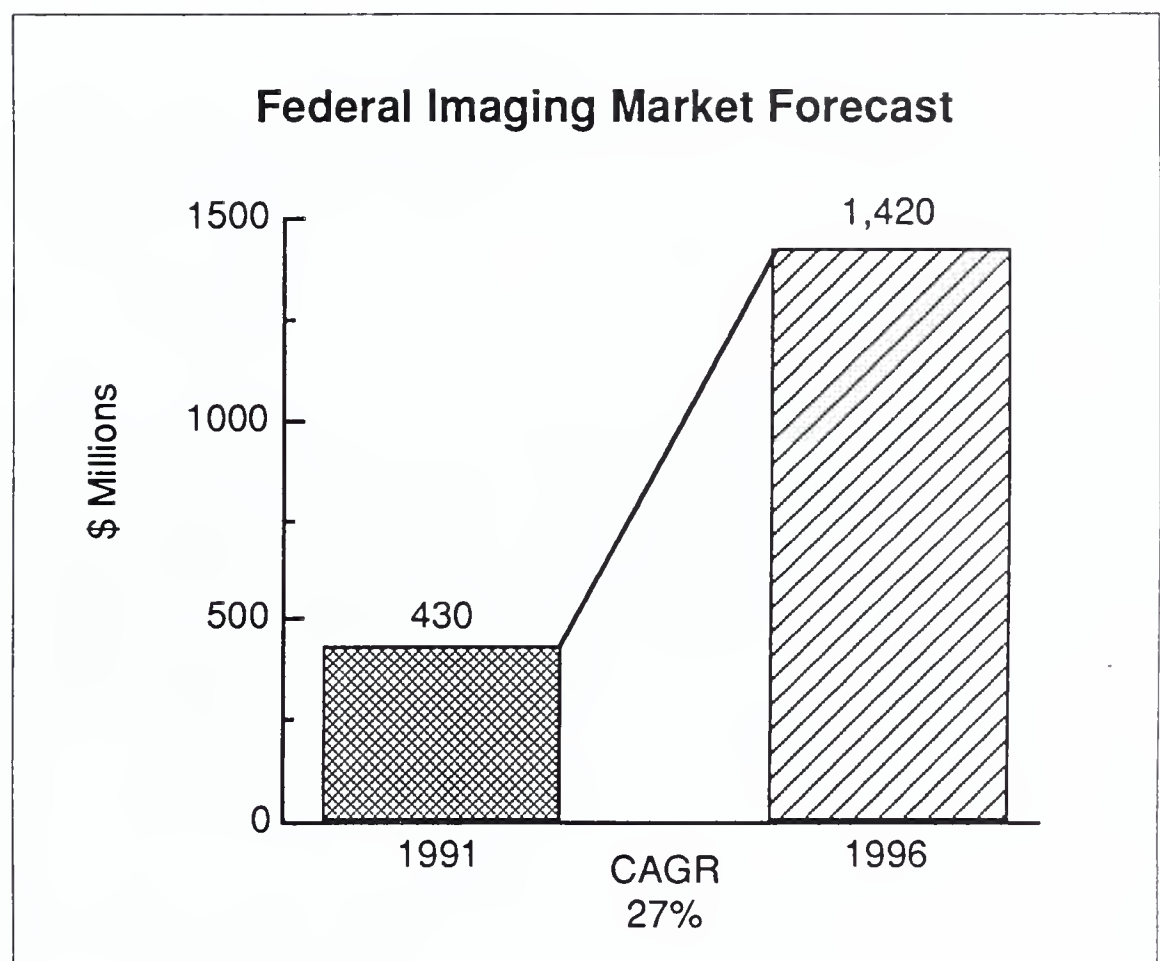
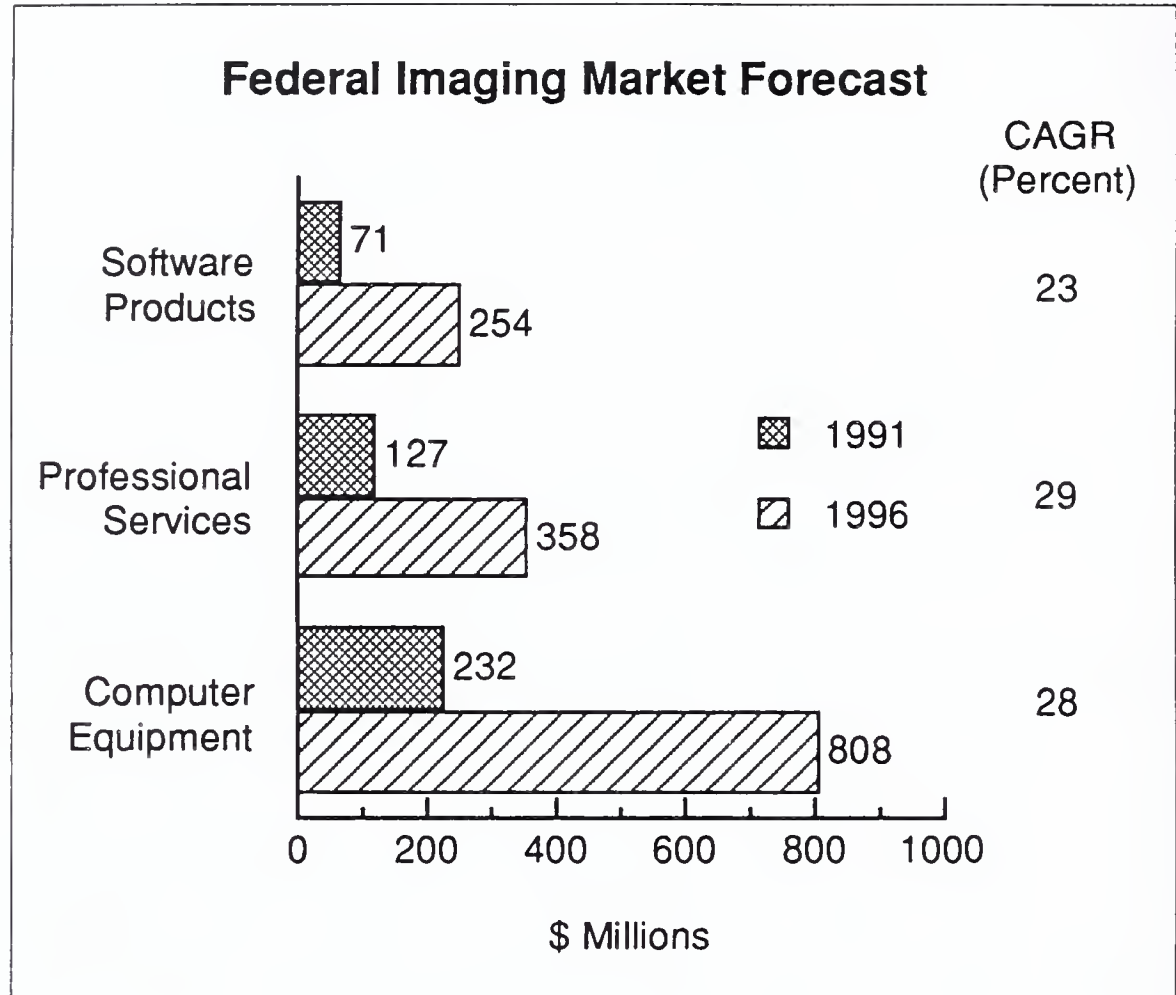


Exhibit III-3 shows a breakout of the imaging forecast into three components. INPUT expects computer equipment to dominate this market. It will grow from \$232 million in FY 1991 to \$808 million in FY 1996, at a CAGR of 28%. This category includes the computer itself (in multiple sizes and configurations), as well as such necessary peripherals as high-resolution monitors, scanners, optical disk drives, and laser printers.

EXHIBIT III-3

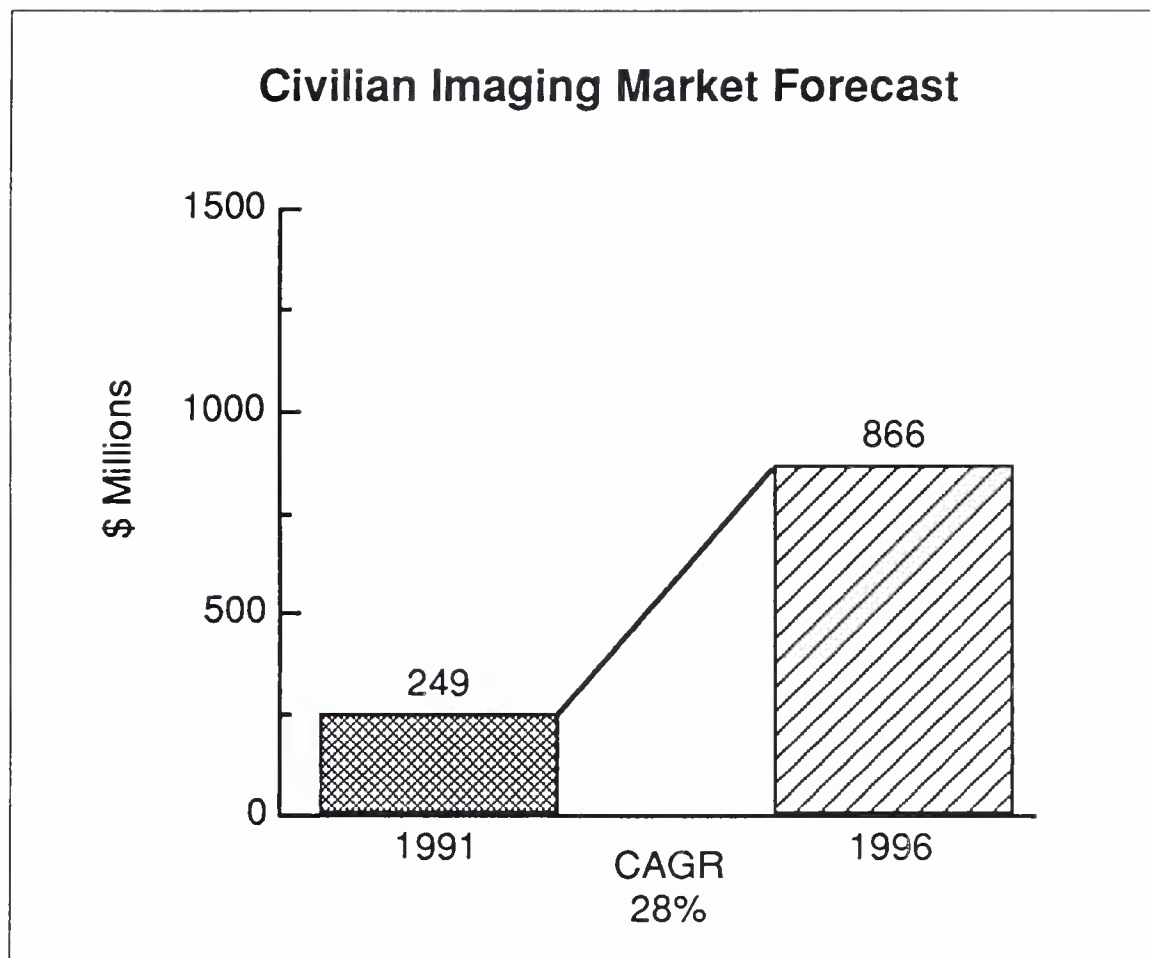


Software products and professional services are also growing rapidly, with the former showing the highest growth rate among the three categories. Professional services takes a smaller share of this market than many other areas that INPUT tracks. Widening availability of software products, especially for standardized applications, has limited the need for tailored software development. Furthermore, the need for consulting and training will also be limited, as agency personnel become more familiar with the technology.

1. Civilian Agency Forecast

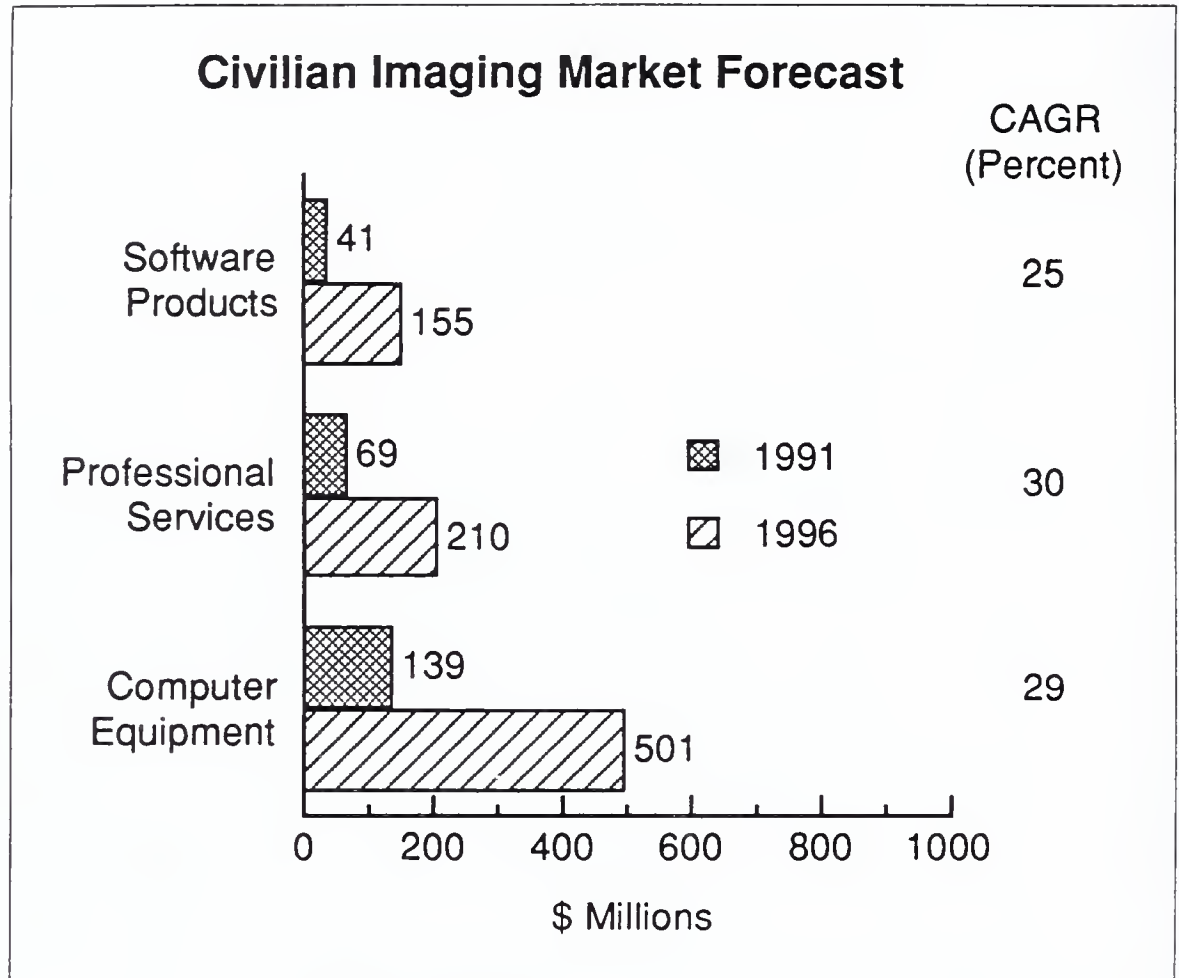
As shown in Exhibit III-4, civilian agencies account for nearly 60% of the federal imaging market. Further, the growth rate for civilian agencies slightly exceeds the overall government rate.

EXHIBIT III-4



In general, civilian agencies tend to have more but smaller programs than the Defense Department. The largest applications involve Commerce's Patent and Trademark Office, Interior's Bureau of Land Management, and Treasury's IRS. Scientifically-oriented agencies, such as NASA and Energy, are applying limited resources to imaging. Exhibit III-5 shows a breakout of the civilian forecast into its component areas.

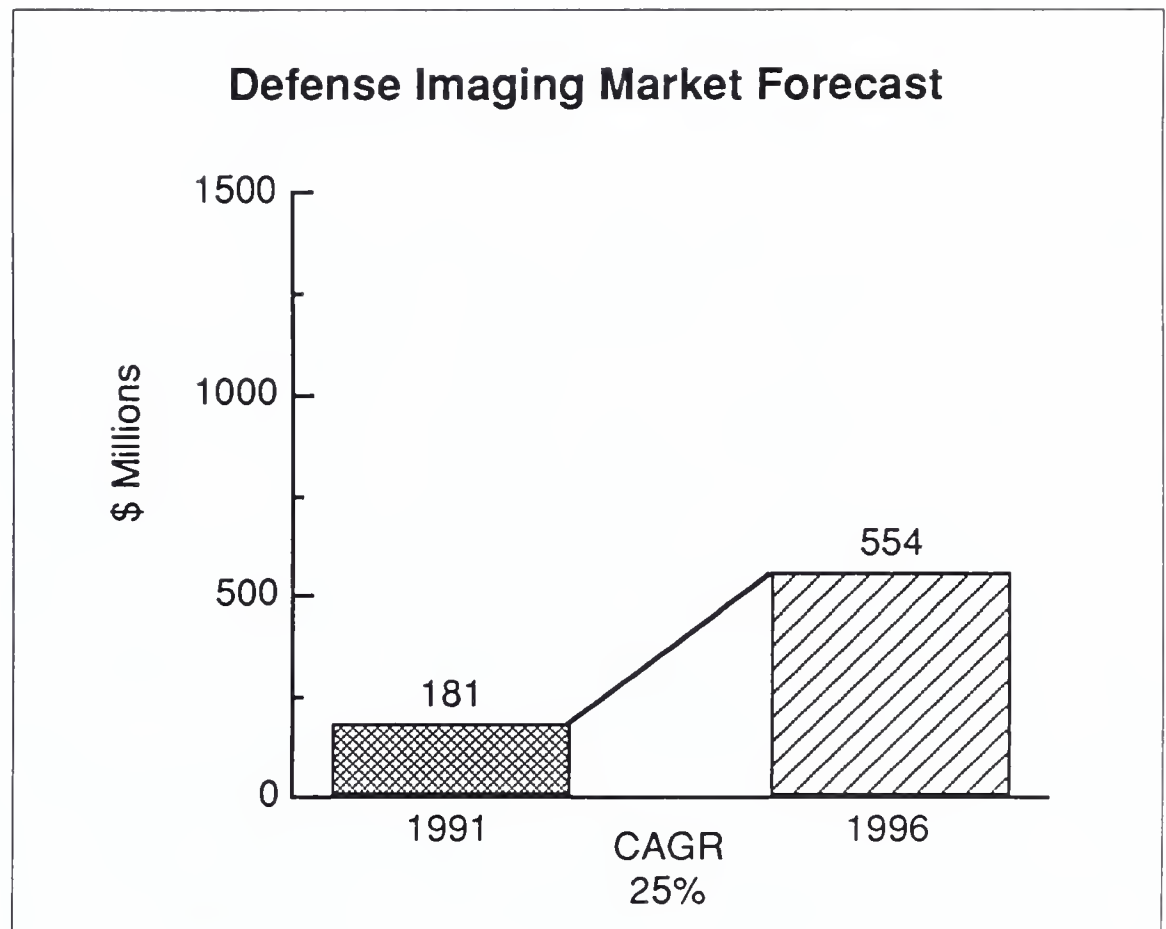
EXHIBIT III-5



2. Defense Agency Forecast

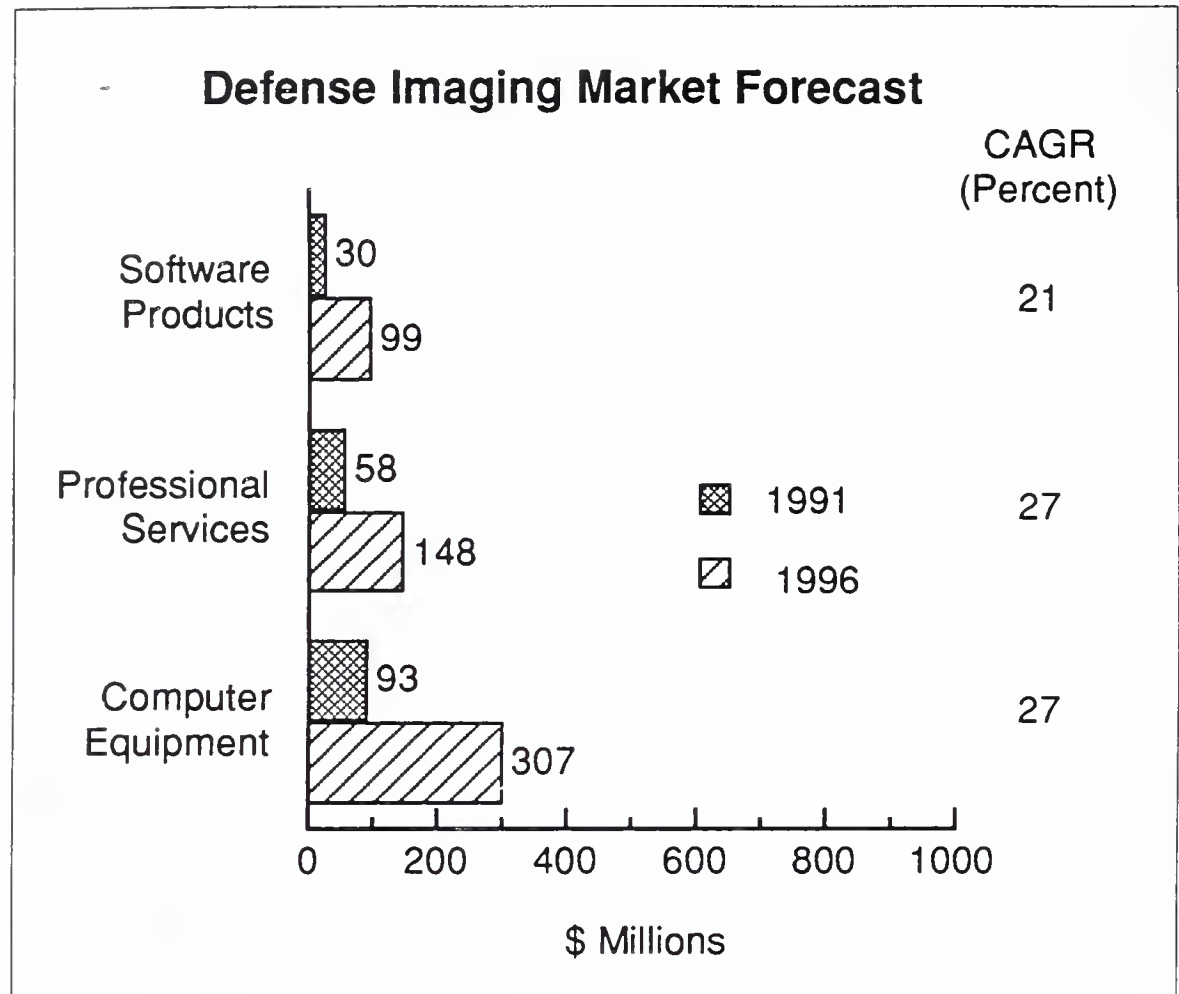
Exhibit III-6 presents the market forecast for imaging products and services for the Defense Department. This area is also growing rapidly (25%). However, because of overall Defense budget constraints, INPUT expects the growth rate to lag behind that of the civilian agencies.

EXHIBIT III-6



Many of the major Defense initiatives relate to Computer-aided Acquisition and Logistics Support (CALS). Imaging technology fits well, since many CALS applications involve raster images of weapons systems and spare parts. INPUT's federal library, in Vienna, VA, has extensive information on CALS. Other, smaller Defense applications involve personnel systems, technical reports and procedural reports. Exhibit III-7 shows a breakout of the Defense forecast into its component areas.

EXHIBIT III-7



D

Leading Vendors

The true leaders in the federal imaging market are extremely difficult to identify. INPUT's standard procedure of looking at contract awards to identify top vendors is virtually impossible to use for the following reasons:

- There is no standard SIC Code or Federal Product Code for imaging systems.
- There is no standard title for imaging system contracts.
- An imaging system may only be a piece of a larger procurement.

Exhibit III-8 lists the leading federal imaging vendors as perceived by the respondent agencies. Vendors are listed in order of the frequency of mention by agencies.

EXHIBIT III-8

Leading Vendors

Vendor	Number of Mentions
Filenet	6
Wang	4
IBM	3
TRW	2
PRC	2
Mitre	1
McDonnell Douglas	1
Sony	1
Colora	1
DEC	1
Kodak	1
Dell	1

Filenet is considered by many respondents an imaging pioneer, because it introduced its WorkFlo software for document management seven years ago. Filenet's imaging system is currently in use at the House of Representatives, managing personnel and accounting records. Filenet uses an open architecture for its WorkFlo Business System software which runs on Filenet UNIX, AT-compatible, DEC, or Sun Microsystems, Inc. workstations.

IBM offers two ImagePlus systems. One of these systems is currently installed at the EPA. One ImagePlus system is meant for enterprise-wide applications, while the other is suited to midrange needs. IBM also has a High Performance Transaction System for check processing. IBM has invested \$25 million in Wang Laboratories, Inc.'s imaging technology and plans to increase that figure to \$100 million if Wang can successfully sell IBM's products.

Wang Laboratories, Inc. recently outlined its strategy for helping office professionals automate information and procedures critical to making their organizations more productive. The plan is built on integrating personal computer networks with document image processing products and applications. The products are based on Wang's OPEN/image architecture which provides a standard framework for imaging on PCs, midrange computers, and mainframes.

TRW Financial Systems, Inc. won a \$5.5 million prototype contract in 1988 to build an image processing subsystem (IPSS) for the U.S. Postal Service. In 1989, TRW won a follow-on contract to develop a more advanced prototype.

PRC is known mostly for its imaging work at the Patent and Trademark Office for the Automated Patent System (APS). The Automated Patent System will eventually contain 15 million U.S. and foreign patents. At this point only 800,000 of these have been loaded onto optical devices for interactive retrieval. PRC's system is based on Sun Microsystems, Inc. workstations.

As previously mentioned, it is difficult to cite the leaders in the imaging market. Many systems integrators are recognized as leaders, such as PRC, McDonnell Douglas, DEC, etc., but most of these integrators use hardware and software manufactured by companies such as Kodak, Sony, Intergraph, etc.

INPUT predicts systems integrators will continue to be the recognized leaders in the imaging market, especially for mainframe and super-computer imaging systems. PC and LAN-based imaging system vendors are becoming more recognized. These companies are bringing imaging closer to the typical office worker. Imaging systems are no longer limited to engineering and scientific applications. Typically, the volume and the complexity of the images to be converted to electronic media will dictate the type and size of vendor chosen for the job. There is much room for growth in the federal imaging arena for integrators, manufacturers, service firms, and other vendors.

E

Recommendations

In the federal imaging market, vendors need to adopt various strategies to succeed. INPUT's recommended strategies are set forth in Exhibit III-9.

Most vendors need to build strong supplier and support relationships to ensure availability of equipment and expertise. Imaging systems have different characteristics than information systems and few vendors have the in-depth knowledge and access to technology necessary for a complex imaging system. Alliances with teaming partners are also important. Agency respondents indicated that imaging experience is one of their selection criteria. Vendors with little or no imaging experience, but who have an established federal background, can use teaming relationships to enter the federal imaging arena.

EXHIBIT III-9

Recommendations

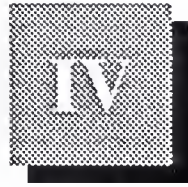
- Establish strong alliances
- Build strong agency relationships
- Incorporate technological advances
- Use standards

Frequently, imaging system procurements lead to repeat purchase of individual pieces of equipment or additional systems. Establishing a strong relationship with an agency may increase a vendor's chance of repeat business within that agency. Quality service to the agency is one way to build a good reputation and relationship.

Studying and incorporating technological advances into a vendor's offering are extremely important in a young industry such as imaging. This approach will help the purchasing agency lessen system obsolescence. Also, allowing for upgrades of technology in the contract will make the system more desirable.

Although imaging standards are ill-defined, it is important for a vendor to include standards in the system offering. The trend for imaging standards within agencies is to use those standards being implemented by industry and the National Institute of Standards and Technology (NIST). Most agencies are moving towards GOSIP compliance and UNIX-based systems. Vendors products should be flexible and not limited to one platform.

The federal electronic imaging industry is new and dynamic. As system costs decrease and the value of imaging becomes more recognized, an increasing number of agencies will see electronic imaging as a means of addressing a variety of problems.



Agency Issues

INPUT surveyed federal government information technology professionals from 19 different agencies. The survey respondents are involved in the planning, purchase, or use of ADP systems. This chapter presents the agencies' responses to questions regarding the environment, applications, installations, acquisition plans, and standards pertaining to imaging systems within that agency.

A

Technical Environment

INPUT asked agency respondents who currently possess an imaging system(s) the hardware platform used for the system. Exhibit IV-1 shows the hardware platforms currently used for imaging systems within the federal sector.

EXHIBIT IV-1

Hardware Platform	
Hardware	Percent
Mainframe	33
Minicomputer	33
Microcomputer	22
Special-purpose Computer	22

Note: More than one response allowed

INPUT LIBRARY

The majority of the federal imaging systems currently in place run on a mainframe or a minicomputer. Some of these systems use microcomputers or high-powered workstations as system terminals. Of the systems in place described by the agency respondents, the type of hardware platform used depends on the volume and complexity of images to be stored. The mainframe-based systems include the Patent and Trademark Office's Automated Patent System (APS), Wright-Patterson AFB's Supply System, and the FBI's current National Crime Information Center system. All of these systems involve extremely large volumes of technical images.

The systems using minicomputers include systems at the National Archives, the U.S. Postal Service, and the Food and Drug Administration. These systems as described by the respondents are significantly smaller than the aforementioned mainframe systems.

Two microcomputer-based systems reside in the Federal Highway Administration. These systems are operated on a local-area network (LAN). The Army Directorate for Image System Support, which provides technical support to Army offices interested in implementing an imaging system, claims that most of the systems it has helped implement are PC based.

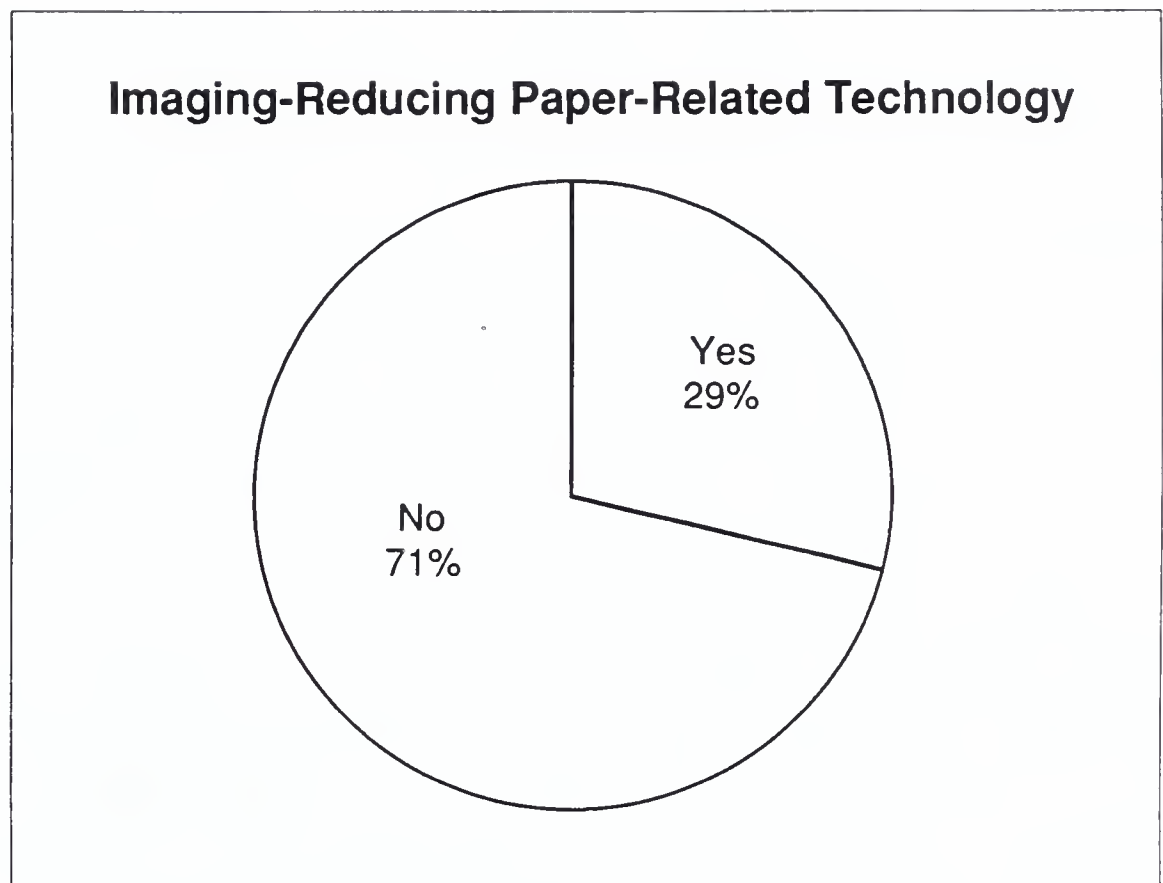
According to federal respondents, data volume and image complexity play a leading role in platform determination, and, of the currently installed systems, mainframes and minicomputers dominate. However, many experts believe that LANs will be the medium used to bring imaging to the common user. Some industry analysts feel that, because imaging has a server-based architecture, it will be more commonly found in LANs than in mainframe- or minicomputer-based environments. Other companies believe the UNIX operating system and powerful workstations may hold the key for future imaging systems.

In a survey conducted by the press, the top three platform preferences for commercial and federal respondents, beginning with the most popular, were minicomputers, PC LANs with a PC or mini-server, and mainframes.

INPUT projects that the platform for federal electronic imaging systems will continue to be dictated by the volume and the intricacy of documents to be stored and processed. PC LAN-based imaging systems will provide an affordable solution for smaller and less complex sets of images and will bring imaging closer to more federal users.

INPUT asked agency respondents their views on the effect of increased imaging technology on paper-related technology, such as copy machines, microfiche, and microfilm. Exhibit IV-2 shows that most respondents believe that increased emphasis on imaging is not causing a reduction in paper-related technology.

EXHIBIT IV-2



There are such tremendous volumes of paper involved in government transactions, as well as commercial business, that the use of paper will always be necessary at some level. Also, the imaging market has not reached maturity, causing prices to remain relatively high. Currently, only limited portions of the government have the financial means to procure or implement imaging systems.

B**Leading Applications and Types of Systems****1. Current Imaging Applications**

Forty-seven percent (47%) of the agency respondents have implemented a document imaging system. These respondents were asked to identify the applications for existing imaging systems or prototypes. Exhibit IV-3 lists these applications in order of frequency of mention.

Financial records and contracts ranked as the most prevalent application for existing imaging systems. The House of Representatives' Office of Finance uses an imaging system for general accounting. The House's system is composed of FileNet imaging products. The system uses FileNet WorkFlo imaging software in a UNIX configuration on the

company's Series 3000 UNIX workstations. The office started with personnel records on the system and recently added accounting documents. The House's Chief of Finance states that the system has vastly increased productivity among employees.

EXHIBIT IV-3

Top Applications for Current Imaging Systems

- Financial records and contracts
- Technical documents
- Human resources
- Freedom-of-information act documents
- Mail sorting and distribution
- Criminal identification and tracking

The Army is also using imaging for financial records management and document processing. The Army Directorate for Image Support has helped set up prototype financial and contract document imaging systems within various Army offices.

Management of technical documents and human resource records also dominates the list of imaging system applications. The Army Directorate for Image Support helped develop prototypes for these applications, as well. The Patent and Trademark Office is using imaging for its Automated Patent System and its Automated Trademark System. Both of these systems involve intricate drawings and technical diagrams, as well as accompanying text.

Wright-Patterson AFB's Base Supply Office uses an imaging system for inventory tracking and order processing. This system also contains technical diagrams and information about the 150,000 different items in base inventory.

The Army's Personnel Electronic Records Management System/Optical Digital Image System (PERMS/ODIS) is an example of imaging applied to human resources documents. This contract is known as one of the most ambitious optical digital imaging projects under way at the Defense Department. PERMS was awarded to EDS in April 1991, but at this writing, the General Services Administration Board of Contract Appeals has ordered the Army to cancel the award. PERMS calls for the conversion of 2.5 million personnel records to electronic image form. Based on the GSBICA ruling, the Army may issue a revised specification.

As stated earlier in this section, the House of Representatives' imaging system began as a personnel records system. The personnel records system includes documents on each of the House's 11,000 employees.

There is also a large installed base of imaging systems being used for classified work in the intelligence and defense markets. INPUT is unable to obtain specific information on classified information systems, but defense agencies often use imaging systems for the applications listed in Exhibit IV-4.

EXHIBIT IV-4

Intelligence and Defense Applications

- Intelligence/surveillance
- Mission planning and rehearsal
- Battlefield management
- Image exploitation
- Overflight analysis
- Multisensor fusion and analysis
- Image archival and retrieval
- Simulation and training

Source: Visual Information Technologies, Inc.

Most of the above applications use photographic quality images with very high resolution and are run on high-level computer systems. A PC LAN-based system would be too slow to handle the complex images involved in the applications listed above.

These applications are not only a subset of the federal imaging market, but are a valuable portion. The systems needed to process and store such complex images obtain a high price.

Vendors should keep in mind the existence of this classified market and its possible future needs for imaging systems.

Systems integrators and vendors of imaging products may focus marketing efforts on the current applications listed. These applications lend themselves to imaging systems and, through the above projects, have proven to be productive and cost efficient.

2. Future Imaging Applications

Seventy-four percent (74%) of those surveyed express plans to implement or purchase imaging systems in FY 1991-FY 1996. Exhibit IV-5 lists the top applications by frequency of mention for planned imaging systems.

EXHIBIT IV-5

Top Applications for Future Imaging Systems

- Financial records management and processing
- Applications management and processing
- Mail and correspondence
- Document archiving

Agency respondents identified five specifically planned imaging projects that involve financial records management or processing. The agencies planning these projects include:

- Internal Revenue Service (IRS)
- Housing and Urban Development (HUD)
- Social Security Administration (SSA)
- House of Representatives
- Army

One of the largest imaging efforts is being conducted by the IRS through the Tax System Modernization Program. Two procurements contained in this program will involve financial records: Document Processing System (DPS) and Check Handling Enhancement and Expert System (CHEXS). The DPS procurement will convert tax returns into image form for processing and storage. The CHEX system will process remittances from taxpayers and capture data from the source documents to update taxpayer accounts on the IRS' master file.

HUD is planning a finance-related imaging system for loan servicing, and SSA wants to implement imaging systems for Social Security claims processing and posting taxpayers' earnings.

In addition to its current general accounting system, the House of Representatives' Office of Finance plans to implement an accounts payable system using imaging technology in FY 1992.

The Army Directorate of Image System Support projects additional Army divisions and offices will implement imaging systems for financial contracts management.

As shown in Exhibit IV-5, integrators and vendors can look for imaging system needs in the realm of applications management and applications processing. INPUT identified programs at the IRS and the Food and Drug Administration (FDA) that will use imaging for processing incoming applications.

The IRS Service Center Recognition/Image Processing System (SCRIPS) will process optical character recognition applications in the National Office and ten service centers. The FDA plans to develop an imaging system for processing new drug applications submitted by pharmaceutical companies.

Imaging system plans for mail and correspondence can be found at HUD, SSA, and the Postal Service. Document archiving systems are planned for PTO, Education, and the Federal Communications Commission.

Opportunities exist in the above application areas as well as those appearing in Exhibits IV-3 and IV-4. Other applications mentioned by respondent agencies include medical records and research documents. Basically, imaging systems can be sold and used anywhere paper documents are created, processed, or filed.

3. Types of Imaging Systems

In 1989 the Office of Management and Budget (OMB) surveyed 27 agencies to assess the federal government's movement from paper to electronic imaging systems. The results of this survey are presented in OMB's *Five-Year Plan for Meeting the ADP and Telecommunications Needs of the Federal Government*.

OMB grouped the reported imaging projects into five types of imaging systems. Exhibit IV-6 lists the categories of imaging systems, as defined by OMB.

EXHIBIT IV-6

Types of Imaging Systems

- Document processing and review
- Information dissemination
- Records management
- Policy development support
- Human resource record keeping

Source: *Five-Year Plan for Meeting the ADP and Telecommunications Needs of the Federal Government*

Document processing systems are characterized by transaction-oriented forms processing, application review, and resolution of customer inquiries. Of the projects reported to OMB, 30.4% fall into this category. Remittance collections and tax form processing are examples of document processing systems. OMB cites the FDA Center for Devices and Radiological Health's Document Image Project as an example. This system, at the time of OMB's study, was in a prototype state. The purpose of the system was to allow on-line review of industry submissions of medical device information.

Systems used for information dissemination are designed to make available large amounts of information or data bases. Only 1.8% of the projects reported to OMB are in this classification. OMB describes the Department of Agriculture's "National Agriculture Text Digitizing Project" as an example. This system is designed to make agricultural information widely available on CD ROM.

Records management systems involve document control and distribution, case management, tracking, and archiving of records. Half of the projects reported on OMB's survey fall into this classification. OMB cites technical and historical records as the prime targets for this type of system. DoD CALS-related projects are good examples that involve technical manuals, engineering drawings and technical military specifications.

Policy development and support systems capture and store information to be used by management for decision making. Of the projects reported to OMB, 7.1% fit into this category. OMB uses the Department of State's Secretariat Tracking and Retrieval System (STARS) as an example. STARS organizes information for principal officers of the Department of State. It aids in tracking, storing, and retrieving foreign policy documents and memoranda generated by the geographic and functional bureaus within the Department.

Human resource record-keeping systems manage personnel, employment, criminal and citizenship status records. Of the reported projects, 10.7% reside in this category. According to OMB's study, this type of system is under development in the Immigration and Naturalization Service, the Federal Bureau of Investigation, the Agency for International Development, and the Department of Defense.

After evaluating the imaging projects reported by agencies, OMB determined that imaging is best suited for the following:

- Information represented one page at a time
- Information represented by handwriting
- Information represented by graphics or photographs
- Information contained in a form
- Information in final form that needs no further updates or processing
- Information generated in paper form by individuals or small businesses

Imaging vendors can focus marketing efforts on agencies that process the types of information listed above. However, most agencies process the above types of information. The key is to find agencies with information systems funding and grossly inefficient paper-based systems.

C

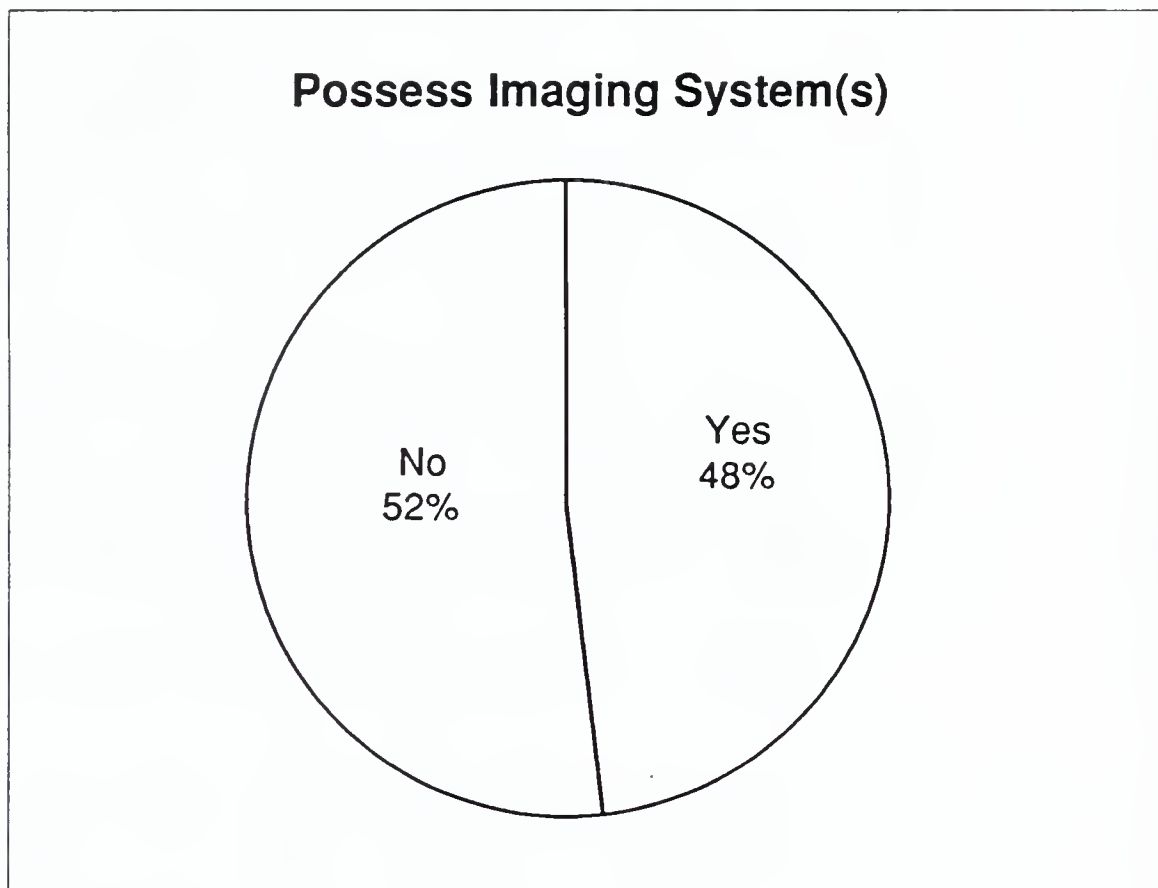
Installation Profile

This section examines the currently installed base of imaging systems within federal agencies. Information used in this section was obtained from surveys of agency IRM officials and secondary research materials.

1. Current Projects

INPUT asked agency respondents if their organizations had ever implemented an information processing system that included the storage and retrieval of electronic images. Exhibit IV-7 shows the percentage of agencies responding positively.

EXHIBIT IV-7



The following surveyed agencies are using imaging systems:

- Wright-Patterson AFB - Base Supply and Inventory System
- PTO - Automated Patent System
- Army - Various systems for personnel records, medical research, technical documents, and financial contracts

- FDA - System for all incoming documents
- FBI - NCIC, FOIAs, and IAFIS
- FHA - Pilot projects for digitizing mail and truck accident reports for FOIA purposes
- House of Representatives - Personnel records, general and accounting, and public disclosure reports
- USPS - Mail and letter sorting
- National Archives - Test system for archival documents

The press has mentioned other existing imaging systems in the following agencies:

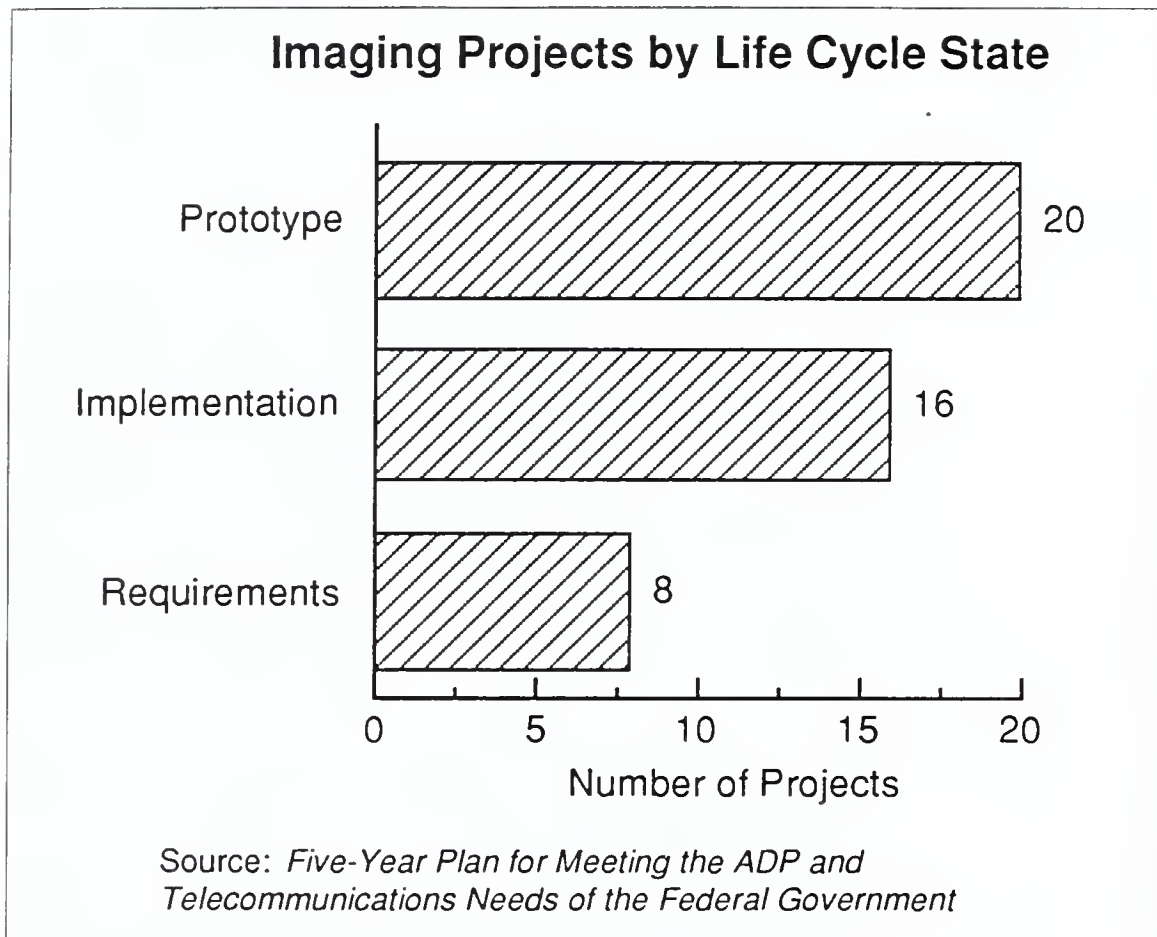
- Environmental Protection Agency
- Department of Treasury's Financial Management Service
- Department of Defense's Uniformed Services University of Health Sciences
- Department of Defense's Computer-aided Acquisition and Logistic Support (CALS)
- Department of Veterans Affairs Washington, D.C. Medical Center
- Agency for International Development
- Public Health Service's Agency for Toxic Substances and Disease Registry
- Department of State's Defense Trade Controls

Imaging vendors and systems integrators may find opportunities within the agencies with existing imaging systems. Agencies with up and running systems recognize the productivity and cost benefits of such systems and may be open to implementing additional systems for other applications within the organization. Other opportunities lie in the area of servicing, maintaining or upgrading the existing systems.

The OMB *Five-Year Plan for Meeting the ADP and Telecommunications Needs of the Federal Government* presented information obtained from 27 federal agencies regarding the use of imaging. This 1989 report stated that few agencies had fully implemented systems using imaging technology,

but that 70% of the imaging projects reported by agencies were in the early systems design stages of developing feasibility studies through prototypes. Exhibit IV-8 shows imaging projects by life cycle state among the 27 agencies surveyed by OMB.

EXHIBIT IV-8



As shown in Exhibits IV-7 and IV-8, many of the existing systems are only prototypes. This situation leaves the opportunity for building a full-scale system within these agencies. Service opportunities also exist for maintenance, conversion, and system redesign.

Agency respondents were also asked who developed their existing system(s). Responses to this question are shown in Exhibit IV-9.

The majority of agencies use both an in-house staff and a systems integrator to design and implement an imaging system. Most agencies want to use their internal systems staff, but look for outside expertise to augment internal capabilities, thus creating opportunities for vendors in the imaging arena.

2. Contract Awards

Contract award information was obtained from INPUT's Procurement Analysis Report (PAR) data base and the *Commerce Business Daily* (CBD). These sources combined represent only about 20% of the total contracts awarded. However, they provide an overview of past contract awards in this market and their value.

EXHIBIT IV-9

Current System Development

Method of Development	Percent
In-house	55
Systems Integrator	66
Other	11

Note: More than one response allowed

A complete list of contract awards for imaging systems is unavailable at this writing due to the following factors:

- There is no standard SIC Code or Federal Product Code for imaging systems.
- There is no standard title for imaging systems (i.e. document management, records management, image management, etc.).
- Acquisition may be of only pieces of a system being internally developed.
- Imaging is only part of a larger information processing system acquisition.

Exhibit IV-10 lists the contract awards identified by INPUT.

The value of contract awards for imaging systems varies greatly relative to the size of the system being procured and implemented. Obviously, the contract value for a mainframe-based system will be significantly greater than that for a microcomputer-based system.

The services or equipment included in each contract award vary greatly. Some contracts include the system design, implementation, and all necessary equipment, while others may only include imaging software.

For these reasons, many opportunities exist in the imaging systems market for both large and small vendors with varying specialized capabilities.

EXHIBIT IV-10

Imaging Contract Awards

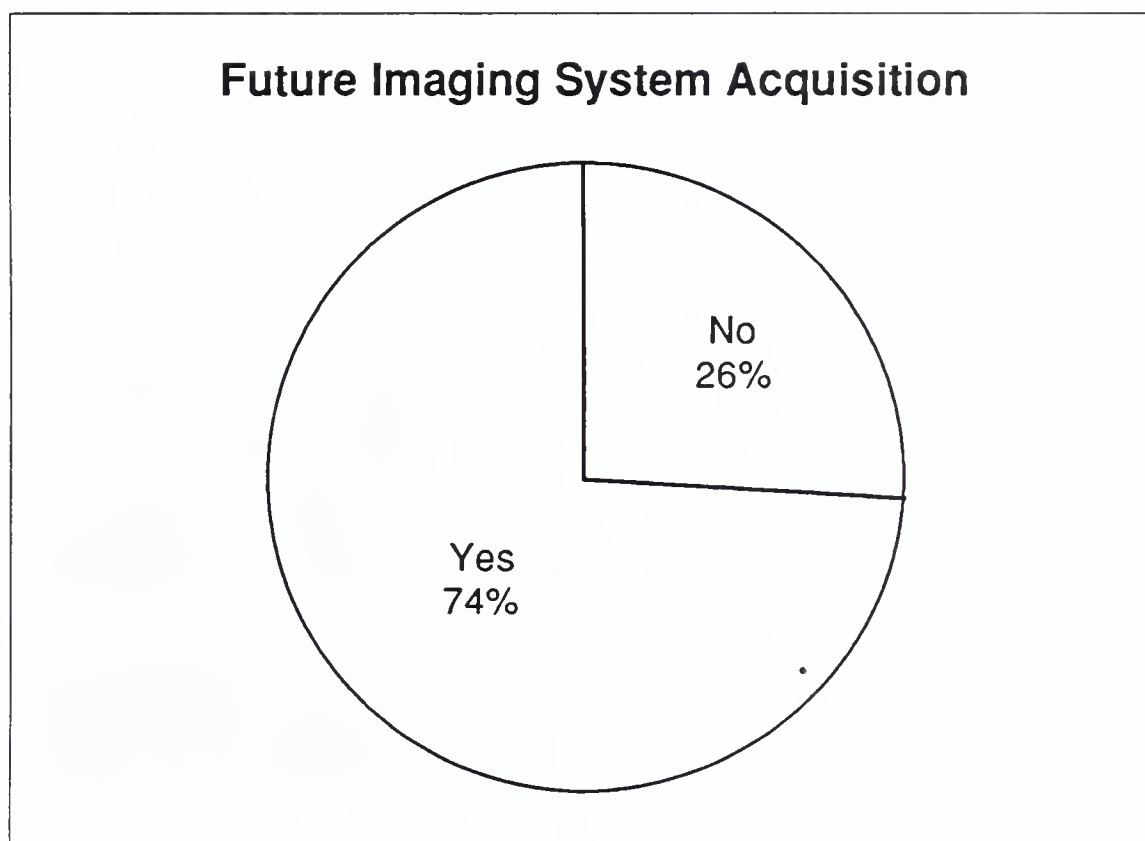
Agency	Subagency	Title	Vendor	Amt. (\$000)
AGR	Forest Service	Image Analysis	Intergraph	100
AGR	ARS	Img. Anal. Upgrade	ERDAS	50
AGR	ARS	Img. Proc. System	Comp Ch	183
AGR	ARS	Img. Proc. System	Sylvest Mgt.	76
Air Force	Offutt AFB	Image Trans. System	Lockheed	7,725
Air Force	LIS	DEARAS	Maxim Tech.	927
Air Force	Arnold EDC	Img. Proc. System	Recogn. Con.	71
Air Force	Kelly AFB	Img. Proc. System	Megavision	170
Air Force	Kelly AFB	Doc. Control System	Kodak	96
Air Force	WPAFB	Img. Methods	Northrop	4,256
Army	Corp of Eng.	Prec. Img. Comp.	Benham Group	48
Army	Corp of Eng.	Design Img. Fac.	URS	185
Army	Walter Reed	Imaging System	Century	612
Army	White Sands	Img. Processor	Gould	30
Commerce	NOAA	Image Station	Int'l. Img. Sys.	33
Commerce	NOAA	Img. Proc. System	Global	179
Energy		Scanner & SW	Falcon	203
Energy		Doc. Procurement	Inst. for Nuc. Power	7,000
Energy		Data Collection	Orkand	26,604
EPA		Imaging System	IBM	54,252
HHS	SSA	Image Procurement	Amdahl	2,848
HHS	SSA	Maint. of Doc. System	Automation Eng.	204
Interior	Geo. Survey	Imaging System	Pixar	114
NASA	Lewis	Imaging System	Recogn. Con.	99
NASA	Lewis	Imaging System	Recogn. Con.	49
NASA	Lewis	Img. Anal. WS	3M	100
NASA	Langley	Image Proc. System	Intertech	130
NASA	Langley	Image Proc. System	Int'l. Img. Sys.	382
NASA	Langley	Opt. Arch. System	Aquidneck	192
NASA	Langley	Image Proc. System	Perceptics	342
NAVY	NRCC	Imaging System	Intertech	91
Navy	Ocean Off.	Image SW Support	Global Imaging	84
Navy	Ocean Off.	Image SW	SeaSpace	25
Navy	Ocean Off.	Image SW	Global	69
Navy	Ocean Off.	Image Processor	Megavision	84
Navy	NATC	Upgr. Img. System	GE	1,578
Navy	Res. Lab.	Comp. Devices	Canastar	87
Navy	Supply Ctr.	Imaging System	Img. Mgt. Assc.	136
Navy	Weap Ctr.	Img. Proc. Comp.	Pixar	45
Navy	Weap Ctr.	Img. Proc. Upgrade	Vicom	50
Navy	Weap Ctr.	Img. Proc. Comp.	ASPEX	121
Navy	Weap Ctr.	Img. Proc. System	Recogn. Con.	60
Navy	Weap Ctr.	Img. Proc. WS	Perceptics	55,357
Navy	Weap Ctr.	Img. Proc. Comp.	Pixar	75
Trans.	CG	Archiving System	Global Imaging	94
USPS		Imaging System	AEG Olympia	4,952
USPS		Imaging System	TRW Financial	5,188
USPS		Imaging System	Bell & Howell	4,292

D**Acquisition Plans and Preferences**

This section describes agency respondents' acquisition plans, system justifications and benefits, acquisition methods, selection criteria, and vendor preferences.

1. Acquisition Plans

INPUT asked agency respondents to identify plans for procuring or implementing imaging systems in FY 1991-FY 1996. Exhibit IV-11 shows that 74% of the respondent agencies plan to purchase or implement imaging systems in the next five years.

EXHIBIT IV-11

The survey results indicate that there is a large demand for imaging systems within the federal market. All of the respondents answering positively to this question referred to the availability of funds and specific procurement plans for obtaining the desired systems.

Also, 89% of the respondents who currently use imaging systems plan to acquire additional systems in the next five years. This observation indicates that agencies using imaging systems recognize their value and are prime targets for imaging vendors.

Exhibit IV-12 lists the agencies planning to acquire imaging systems in FY 1991-FY 1996, according to INPUT's survey.

EXHIBIT IV-12**Agencies Planning to Acquire Imaging Systems**

- HUD
- Air Force - Wright Patterson AFB
- Army
- FDA
- FHA
- House of Representatives
- Education
- Energy
- USPS
- FCC
- IRS

Section B of this chapter discussed the applications of these future imaging projects. Exhibit IV-13 lists the largest future imaging projects:

EXHIBIT IV-13**Largest Future Imaging Projects**

- FBI
 - NCIC 2000 - National Crime Information Center
 - IAFIS - Integrated Automated Fingerprint Identification System
- IRS
 - SCRIPS - Service Center Recognition/Image Processing System
 - DPS - Document Processing System
 - CHEX - Check Handling Enhancement and Expert System

Imaging system procurements do not seem to be restricted to any particular agency or application. Opportunities for imaging systems equipment and services are prevalent in most agencies. Divisions and offices within agencies that handle large volumes of paper are prime targets.

Agency respondents were asked to project spending by their organization on imaging technology for FY 1991-FY 1996. Exhibit IV-14 shows the anticipated spending of the respondent agencies.

EXHIBIT IV-14

Anticipated Spending on Imaging Systems

	(\$000)	
	FY92	FY91-FY96
Agency Average	625	4,250

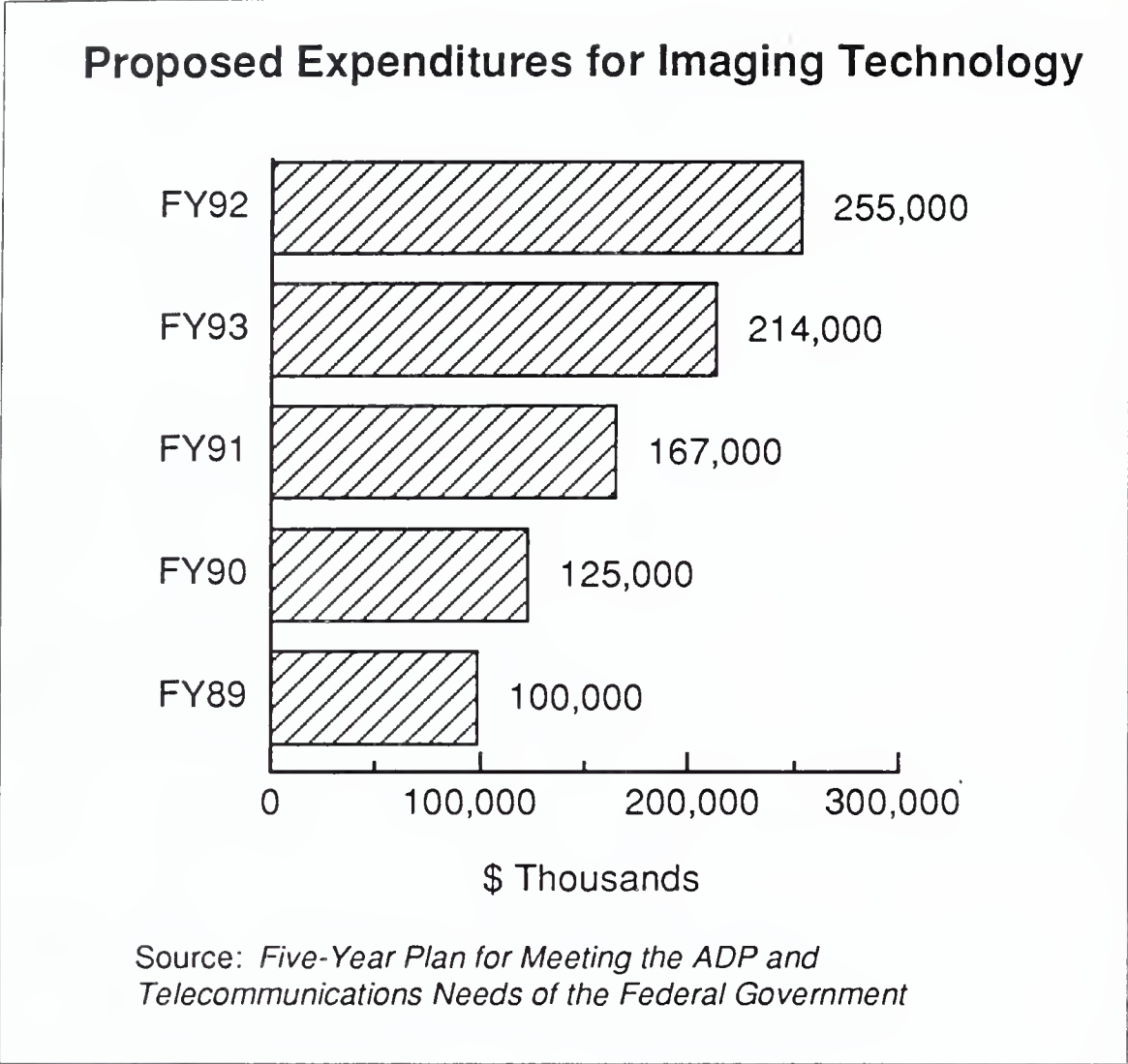
One-half of the agency respondents, whose organizations intend to purchase or implement imaging systems in the next five years, were unable to project spending levels. Although these spending projections are not complete, they do add insight to the future of the imaging market. With the exception of the IRS and FBI, most agencies will be purchasing small (under \$1 million) imaging systems in the next five years, but they plan to purchase several systems for different applications over this time period.

According to OMB's 1989 survey, the total proposed expenditures for imaging technology for FY 1989-FY 1993 amount to \$864 million. Exhibit IV-15 shows the results of the OMB survey for imaging expenditures.

OMB states that three projects account for approximately 86% of the above proposed expenditures: DoD's CALS, IRS' Tax System Modernization Program, and PTO's Automated Patent System. This explains the tremendous difference in Exhibits IV-14 and IV-15.

Electronic imaging is still an immature, but advancing, market. Most agencies have not budgeted large sums of money for imaging, but many plan to purchase relatively small systems in the next five years. This could mean repeat purchases of larger, more complex systems in the next ten to fifteen years.

EXHIBIT IV-15



2. Justification and Benefit

Agency respondents were asked to rate factors for system justification. Exhibit IV-16 shows the average rating for each system justification factor.

Improved customer service and improved records management received the highest rating. All the respondent agencies, both those with existing systems and those planning to implement systems, feel that improved customer service is an important factor in system justification. By using imaging systems, agencies can retrieve, manipulate, and store documents much faster than historical paper systems. This translates into increased employee productivity and more efficient service to an agency’s customer.

EXHIBIT IV-16

Factors for System Justification

Justification	Average Rating
Improved Customer Service	4.4
Improved Records Management	4.0
Savings on Storage Media	3.6
Space Savings	3.2
Personnel Savings	2.8

Ratings: 1 - 5, with 5 being most important

For example, the IRS reported that, during its peak tax season, it expects a decrease in processing time per income tax statement by a factor of seven as a result of imaging. The Department of Veterans Affairs reported to OMB that its image processing system reduced the amount of time needed to retrieve information on a certain veteran from 3 days to approximately 45 seconds.

Improved records management is another important justification for respondent agencies. Not only are records retrieved faster, they are also maintained more easily than in paper-based systems. The imaging system files the images electronically so they are rarely misplaced or lost. Also, in many systems, records may be accessed by multiple users at the same time. Imaging systems allow improved association of documents, automatic document routing, increased information dissemination, and document tracking capability.

Other justification factors mentioned by agencies are improved employee job satisfaction, improved internal efficiency, and improved employee performance.

When proposing imaging systems to federal agencies, vendors need to present how their solution can provide these benefits and justify the system expense.

OMB states in its report on the use of imaging systems in the government that imaging appears to be most cost-effective for uses with the following characteristics:

- Access to information must be rapid
- Information must be accessible to multiple users at the same time
- Information requires wide publication or distribution

The implication is that quantifiable benefits are more likely to be realized in time-sensitive or transaction-oriented applications, because converting and storing documents in image form can be more expensive than paper formats. Thus, imaging applications that employ frequent document retrieval are most likely to achieve the quantifiable benefits of imaging technology.

Only one-third of all applications found in OMB's survey and approximately 40% of the applications found in INPUT's survey are transaction-oriented. OMB suggests other benefits for system justification that are not as easily quantifiable:

- Improved transport of information, improved information sharing, increased information dissemination
- Increased management control, increased amount of information tracked
- Improved workflow and process control

In product marketing, vendors should emphasize the above benefits and justifications to convince agencies to purchase their system. Cost/benefit analysis is a dynamic selling tool in the federal imaging market.

3. Methods of Acquisition

The majority of agency respondents claimed their organization would prefer to acquire imaging systems through a Request For Proposals (RFP). Exhibit IV-17 shows the average rating of different acquisition methods as expressed by agency respondents.

Using an RFP as a method of acquisition allows the agency to specify exact system requirements. It also allows experts in the imaging industry to respond with a proposal suited to that agency's individual needs.

The results of this survey question relate to the method of system development for agencies with existing systems. Exhibit IV-9 shows that 77% of the agencies with existing imaging systems used something other than their in-house staff to implement their existing system. Hence, the agencies used RFPs to acquire the systems.

EXHIBIT IV-17

Acquisition Method Preference

Method	Average Rating
RFP	3.9
Requirement Contract	2.5
GSA Schedule	2.3
Excess Equipment	1.6

Rating: 1-5, with 5 being most important

RFPs are also typical of larger procurements (over \$500,000). Small imaging systems may be purchased using an in-house staff and GSA schedules, but large complex systems normally require industry expertise.

Imaging experience, team building ability, and proposal writing skills will play key roles in agencies' vendor selection process. Also, incorporating off-the-shelf equipment in RFP-based procurements is becoming increasingly important.

4. Selection Criteria

Agency respondents were asked to rate the importance of several selection criteria used in the evaluation of imaging system purchases. Exhibit IV-18 lists the average ratings for each of these criteria.

All of the selection criteria ranked high in importance among agency respondents except "vendor's federal experience." Respondents expressed the importance of experience in the imaging market, but not necessarily the federal market. Many respondents feel that there are few established federal contractors with proven imaging expertise.

Ease of implementation ranks the highest among selection criteria. Agencies are looking for a smooth transition from their current system to an imaging system. Vendor assistance and involvement in the conversion stages of the project are essential.

EXHIBIT IV-18

Selection Criteria

Criteria	Average Rating
Ease of Implementation	4.4
Vendor's Support Reputation	4.2
Software Features	4.2
Product Price	4.0
Equipment Reputation	4.0
Vendor's Federal Experience	3.1

Ratings: 1-5, with 5 being most important

Agencies will evaluate potential vendors on the criteria listed above. Vendors need to choose solutions and develop proposals that meet these criteria. Team building will be important for contractors lacking imaging experience. Likewise, companies with imaging experience will want to team with companies possessing a strong federal background.

5. Preference for Type of Vendor

INPUT asked agency respondents if they preferred a certain type of vendor for imaging system implementation. Agency answers to this question appear in Exhibit IV-19.

Approximately one-half of the agency respondents have a particular vendor preference. This indicates that being a certain type of vendor should not be a hindrance to work in the imaging market, but as we will see in the next exhibit, systems integrators may have a slight advantage over other vendors in the federal imaging market.

EXHIBIT IV-19

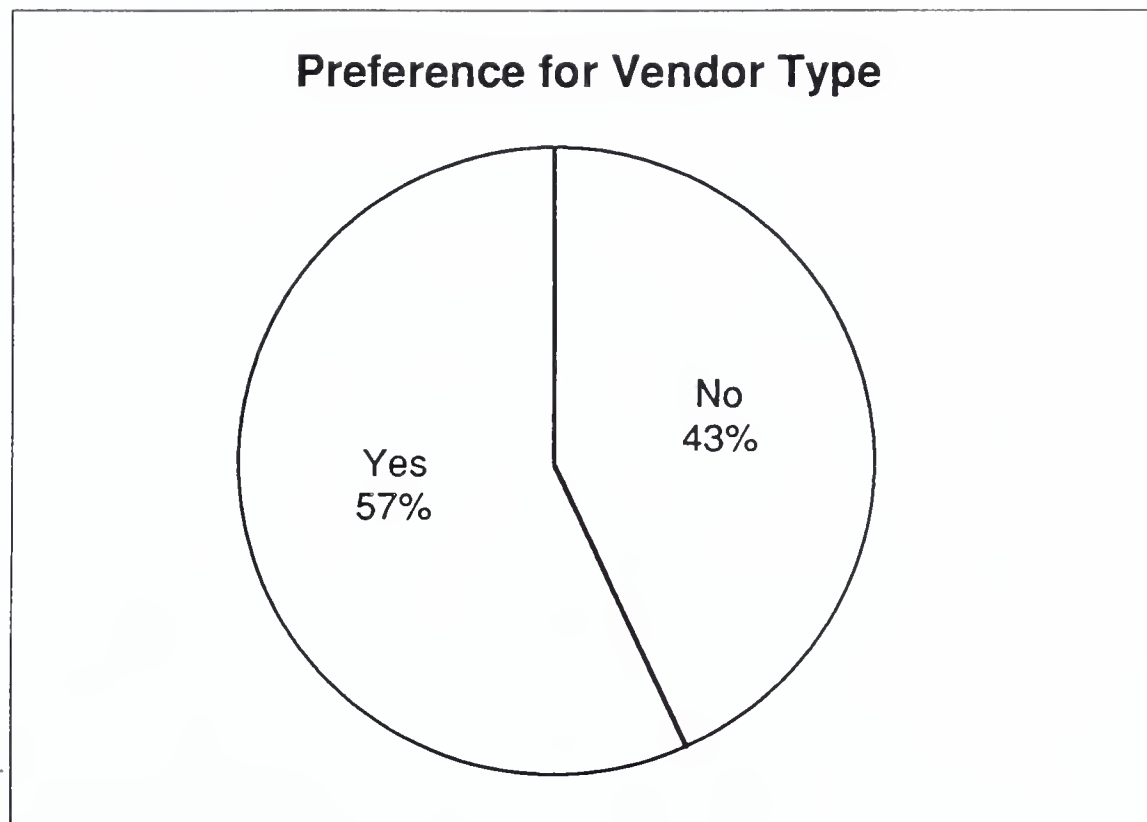
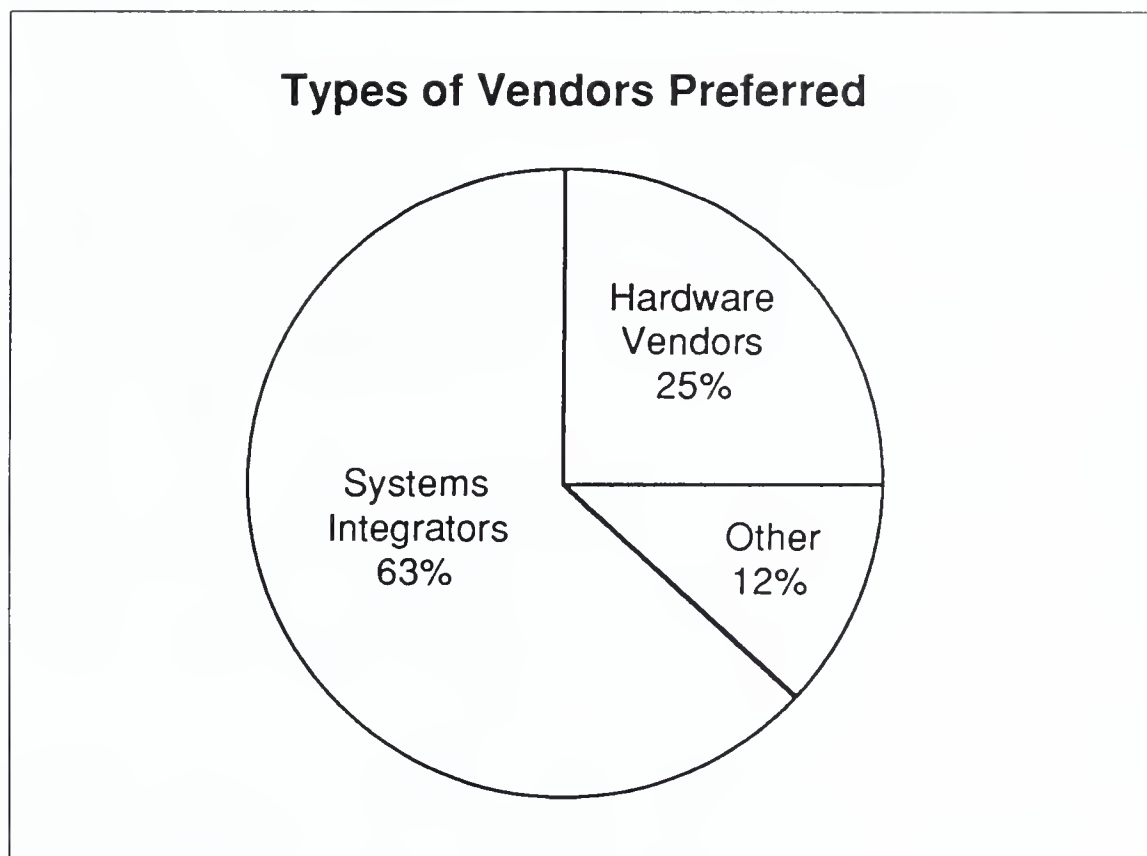


Exhibit IV-20 shows the types of vendors preferred by those agencies expressing a preference.

EXHIBIT IV-20



Systems integrators ranked highest as the preferred imaging vendor. Agency respondents feel integrators have the necessary skills to bring together all of the resources needed to build and implement a custom imaging system. Systems integrators are also perceived as having the most experience in the federal imaging arena. This may be due to the publicity given to large imaging system projects, such as PTO's APS and the Army's PERMS. Logically, these systems are being implemented by systems integrators because of their large scope, but smaller systems are being implemented at a faster rate by smaller, non-SI companies.

Twelve percent (12%) of the respondents stated that they have no preference for the type of vendor they would choose, but that imaging experience is a must.

The federal imaging market is open to all types of vendors and not limited to systems integrators. Vendors should focus on their imaging experience and use this as a selling point. Vendors with little imaging experience may want to establish team relationships with vendors who have this type of experience. The federal marketplace will provide for large- and small-scale imaging opportunities in many different agencies for a vast number of applications. Finding the right niche in the federal imaging market can lead to even more opportunities. Becoming a company known for a certain size of system or a system especially suited for certain applications can lead to increased marketability.

E

Standards and Legality

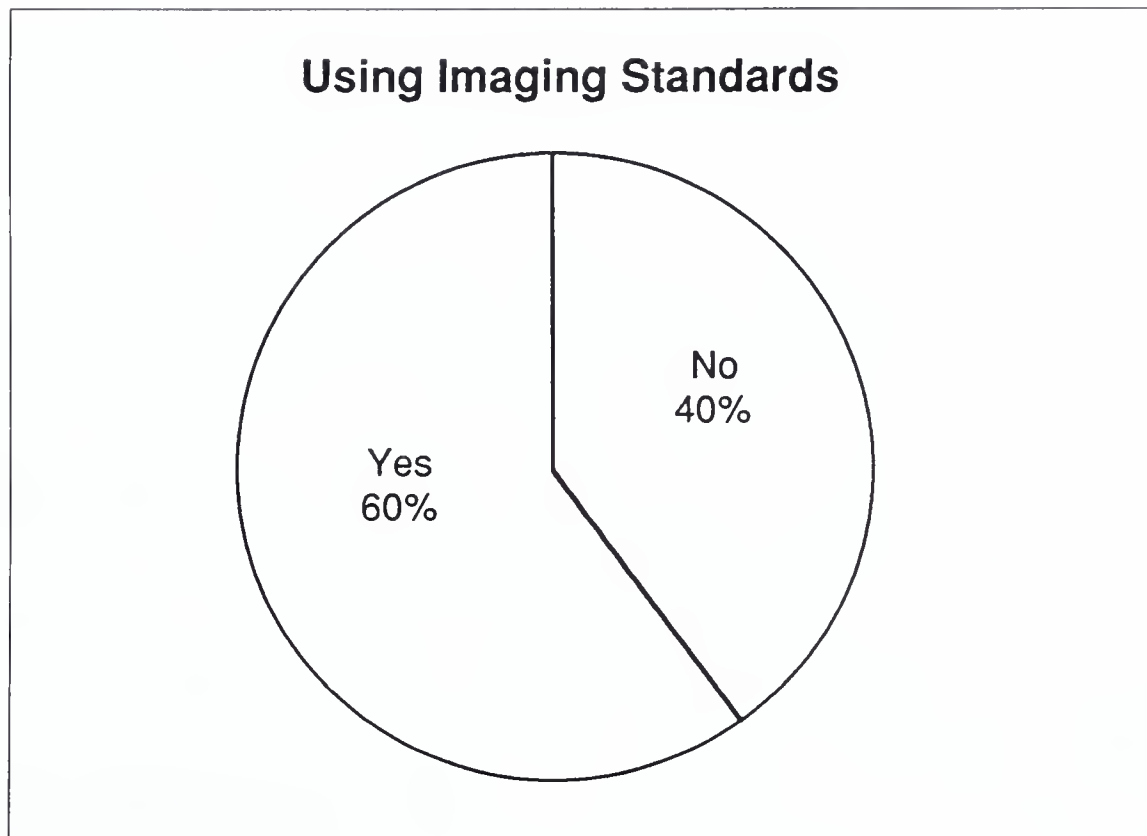
This section discusses the use of standards in imaging systems. The standards used by federal agencies today and the standards being developed for the future are discussed. The use of electronic images as legal substitutes for original documents and the effect of this on the market are also discussed.

1. Imaging Standards

Because the market for electronic imaging systems is still in the introductory phase, standards are ill defined. INPUT asked agency respondents if their organizations were using any type of standards for their current or proposed imaging systems. Exhibit IV-21 shows 60% of the agencies surveyed are applying standards to their imaging systems.

The market for imaging systems is still developing and growing and standards are a great concern. Federal agencies do not want to implement a system today that will become obsolete tomorrow because of incompatibility with future internal or external systems. Exhibit IV-21 shows that the majority of agencies are attempting to implement some type of imaging standards to avoid a possible incompatibility problem.

EXHIBIT IV-21



The existence of standards will be another consideration in agencies' system evaluation process. Imaging vendors need to be aware of imaging standards used in the agency and should tailor their system to any existing standards.

Exhibit IV-22 lists the standards in place within the respondent agencies. Standards are listed in the order of frequency of mention.

EXHIBIT IV-22

Standards in Use

• TCP/IP	• CCITT
• UNIX	• GOSIP
• POSIX	• ANSI

Transmission Control Protocol/Internet Protocol (TCP/IP) is one protocol standard adopted by organizations in an effort to achieve open systems. However, the federal government is moving toward GOSIP-compliant systems as a federal standard. TCP/IP is not GOSIP. This could cause problems for agencies with TCP/IP systems in place. Federal vendors will

be required to provide GOSIP systems to agencies. The commercial world uses several different protocols, but OSI is not the most popular. This may be a problem for vendors attempting to market imaging systems to the federal government and the commercial world.

CCITT Group 3 and 4 are international compression/decompression standards of the Consultative Committee for International Telegraphy and Telephony, also used for facsimile transmission. Several agencies mentioned using these standards in their imaging systems for the image file format.

Because the technology is still evolving, standards are lacking, but imaging vendors need to remain aware of GOSIP compliance and any other federal standards that may develop.

Exhibit IV-23 shows how agencies are developing imaging standards.

EXHIBIT IV-23

Standards Development	
Development Method	Percent Respondents
In-house	0
Interagency Groups	10
Vendor	10
Combination	80

The majority of respondent agencies are implementing a combination of vendor and industry-developed standards. Most agencies are not developing standards independently within their agency or with other agencies. Survey respondents feel that imaging vendors and those in commercial industry have more experience in developing and using imaging standards, leading most agencies to adopt standards already in use. Agencies purchasing imaging systems will be looking for vendors who will implement standards compatible with the standards already being used in the federal and commercial world.

Agency respondents do not feel that the existence or nonexistence of imaging standards will affect the implementation of imaging systems within their agencies. Exhibit IV-24 shows that 60% of those agencies surveyed do not believe that inconsistent standards will hinder them in purchasing imaging systems.

EXHIBIT IV-24

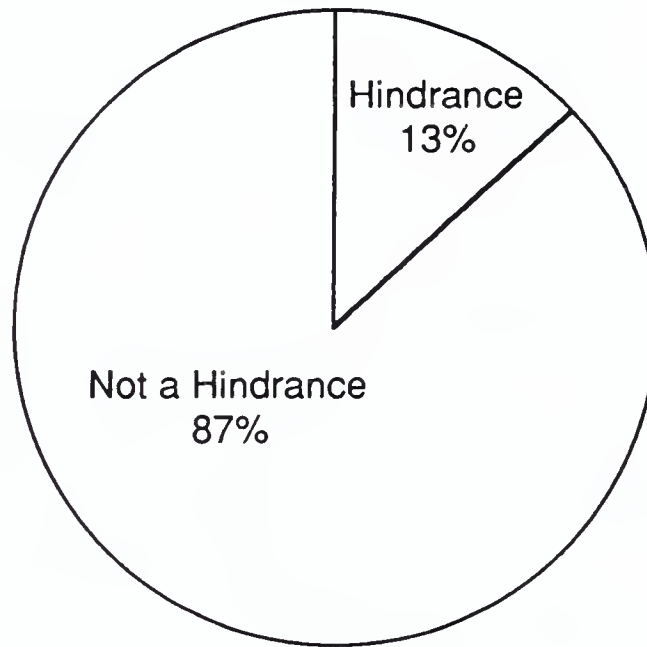


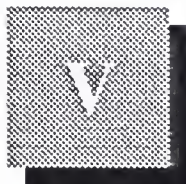
Vendors should not wait for the development of federal imaging standards. Agencies have shown their desire to purchase imaging systems in the face of inconsistent standards, as long as the vendor can show adherence to some type of standardization. This also leaves room for the innovative company to enter the market and create the industry imaging standard.

In the past, there has been much debate over whether a document image is a legal substitute for the original document. INPUT asked agency respondents if this controversy has hindered their agency in implementing an imaging system in the past. Exhibit IV-25 shows that 87% of the respondents do not see the debate of legal substitution as a hindrance in imaging system purchases within their agencies.

This discovery should ease the minds of some imaging vendors. Most agencies are concerned with increasing productivity and efficiency within their organizations. Agencies surveyed claimed that the legal substitution issue is not a factor in determining whether or not to purchase an imaging system.

EXHIBIT IV-25

Document Images as Legal Substitutes



Key Opportunities

This section describes specific opportunities in the federal electronic imaging market. Lists of programs are provided for future imaging system acquisitions. The list of opportunities consists of programs that are typical of the federal market and serves as a representative sample.

A

Present and Future Programs

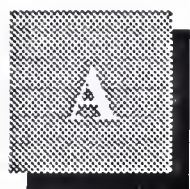
New information technology programs that are larger than \$1 million to \$2 million are listed in at least one of the following federal government documents:

- OMB/GSA Five-Year Plan, which is developed from agency budget requests submitted in compliance with OMB Circular A-11
- Agency long-range information resource plans developed to meet the reporting requirements of the Paperwork Reduction Act of 1980
- Agency annual operating budget requests submitted to both Congressional Oversight and Appropriations Committees based on the OMB A-11 information
- *Commerce Business Daily* for specific opportunities, for qualifications as a bidder, and to obtain a copy of the RFP or RFQ
- Five-Year Defense Plan, which is not publicly available, and the supporting documentation of the separate military departments and agencies
- Classified program documentation available to qualified DoD contractors

B**Federal Electronic Imaging Opportunities by Agency**

Program	PAR Number	Funding FY91-FY96 (\$000)
<u>Commerce</u>		
Automated Patent System (APS)	VI-06-027	455,000
Automated Trademark System (ATS)	VI-06-043	45,448
Optical Disk Storage and Retrieval	VI-06-020	
<u>Defense</u>		
Computer-Aided Acquisition (CALS)	V-04E-004	
<u>EPA</u>		
Permit Compliance System (PCS)	VIII-17-009	
<u>Health and Human Services</u>		
Optical Character Recognition (OCR)	VII-08-045	
Turnkey Imaging System	VII-08-047	
<u>Justice</u>		
Integrated Automated Fingerprint Identifica- tion System (IAFIS)	VII-10-029	
<u>Nuclear Regulatory Commission</u>		
Optical Disk Technology	VIII-29-001	6,000

Program	PAR Number	Funding FY91-FY96 (\$000)
<u>Treasury</u>		
Interagency Border Inspection (IBIS)	VII-12-076	50,000
Series E/EE Savings Bond (SEAS)	VII-12-069	18,480
Service Center Support System (SCSS)	VII-12-065	2,200,000
Tax System Modernization (TSM)	VII-12-006	8,000,000



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Appendix: Interview Profiles

A

Federal Agency Respondent Profile

Contacts with agencies were made by telephone. The majority of the agency interviews were conducted at the departmental level, with officials in the office of Information Resources Management who are responsible for computer systems policy and planning.

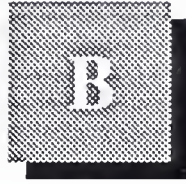
The distribution of job classifications among individual agency respondents for the analysis is as follows:

	Policy	Buyers	Users	Total
Respondents	3	10	6	19

Respondents interviewed represented the agencies listed below, with the number in parentheses indicating the number of different contacts with the agency.

- Department of Defense
 - Army (1)
 - Air Force (1)
 - Defense Uniformed Services University of Health Sciences (1)
 - Defense Mapping Agency (1)
- Civilian Agencies
 - Department of Housing and Urban Development (1)
 - Patent and Trademark Office (1)
 - Food and Drug Administration (1)
 - Federal Bureau of Investigation (1)
 - Federal Highway Administration (1)
 - House of Representatives (1)
 - Social Security Administration (1)

- Forest Service (1)
- Department of Education (1)
- Department of Energy (1)
- U.S. Postal Service (1)
- National Archives (1)
- Federal Communication Commission (1)
- Internal Revenue Service (1)
- Federal Emergency Management Agency (1)



Appendix: Definitions

Appendix B provides a summary of definitions specifically related to imaging products and services.

Analog - Signal or transmission type with continuous waveform representation.

Digital - Signal or transmission type using discontinuous, discrete quantities to represent data.

Erasable Disk - A type of disk that allows users to erase data previously written. Erasable disks are used for applications where data may need to be updated periodically.

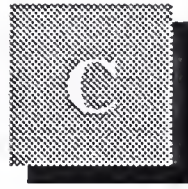
Optical Disk - Storage device that uses laser technology to record data. Optical disks provide high storage capacity, but cannot be overwritten.

Read-Only - A type of disk that is prerecorded and can be used for retrieving data. A read-only disk cannot be overwritten. A read-only system will retrieve and display stored data, but the system cannot alter the stored data.

Read/Write - A type of disk that can be read and written upon. A read/write system will read and display stored data and alter data already recorded.

Write-Once - A type of disk that can be created one time. Once written on, the disk can only be read. It cannot be rewritten.

WORM (Write-Once, Read-Many) - A type of disk that can be created one time. Once written on, the disk can only be read without destroying data on the disk.



Appendix: Glossary of Federal Acronyms

The federal government's procurement language uses a combination of acronyms, phrases, and words that is complicated by different agency definitions and interpretations. The government also uses terms of accounting, business, economics, engineering, and law with new applications and technology.

Acronyms and contract terms that INPUT encountered most often in program documentation and interviews for this report are included here, but this glossary should not be considered all-inclusive. Federal procurement regulations (DAR, FPR, FAR, FIRMR, FPMR) and contract terms listed in RFIs, RFPs, and RFQs provide applicable terms and definitions.

Federal agency acronyms have been included only to the extent that they are employed in this report.

A

Federal Acronyms

AAS	Automatic Addressing System
AATMS	Advanced Air Traffic Management System
ACO	Administrative Communications Satellite (formerly NASA 30/20 GHz Satellite Program)
ACT-1	Advanced Computer Techniques (Air Force)
Ada	DoD High-Order Language
ADA	Airborne Data Acquisition
ADL	Authorized Data List
ADS	Automatic Digital Switches (DCS)
AFA	Air Force Association
AFCEA	Armed Forces Communications Electronics Association
AGE	Aerospace Ground Equipment
AIP	Array Information Processing
AIS	Automated Information System
AMPE	Automated Message Processing Equipment
AMPS	Automated Message Processing System
AMSL	Acquisition Management Systems List

ANG	Army National Guard
AP(P)	Advance Procurement Plan
Appropriation	Congressionally-approved funding for authorized programs and activities of the Executive Branch
APR	Agency Procurement Request
ARPANET	DARPA network of scientific computers
ASP	Aggregated Switch Procurement
ATLAS	Abbreviated Test Language for All Systems (for ATE-Automated Test Equipment)
Authorization	In the legislative process programs, staffing, and other routine activities must be approved by Oversight Committees before the Appropriations Committee will approve the money from the budget.
AUSA	Association of the U.S. Army
AUTODIN	AUTOMatic Digital Network of the Defense Communications System
BA	Basic Agreement
BAFO	Best and Final Offer
Base Level	Procurement, purchasing, and contracting at the military installation level.
BCA	Board of Contract Appeals
Benchmark	Method of evaluating ability of a candidate computer system to meet user requirements
Bid Protest	Objection (in writing, before or after contract award) to some aspect of a solicitation by a valid bidder
BML	Bidders Mailing List - qualified vendor information filed annually with federal agencies to automatically receive RFPs and RFQs in areas of claimed competence
BOA	Basic Ordering Agreement
B&P	Bid and Proposal - vendor activities in response to government solicitation/specific overhead allowance
BPA	Blanked Purchase Agreement
Budget	Federal Budget, proposed by the President and subject to Congressional review
C2	Command and Control
C3	Command, Control, and Communications
C4	Command, Control, Communications and Computers
C3I	Command, Control, Communications and Intelligence
CAB	Contract Adjustment Board or Contract Appeals Board
CADE	Computer-Aided Design and Engineering
CADS	Computer-Assisted Display Systems
CAIS	Computer-Assisted Instruction System
CALS	Computer-Aided Automated Logistic System
CAPS	Command Automation Procurement Systems
CAS	Contract Administration Services or Cost Accounting Standards

CASB	Cost Accounting Standards Board
CASP	Computer-Assisted Search Planning
CBD	Commerce Business Daily - U.S. Department of Commerce publication listing government contract opportunities and awards
CBO	Congressional Budget Office
CCEP	Commercial Comsec Endorsement Program
CCDR	Contractor Cost Data Reporting
CCN	Contract Change Notice
CCPDS	Command Center Processing and Display Systems
CCPO	Central Civilian Personnel Office
CCTC	Command and Control Technical Center (JCS)
CDR	Critical Design Review
CDRL	Contractor Data Requirement List
CFE	Contractor-Furnished Equipment
CFR	Code of Federal Regulations
CICA	Competition in Contracting Act
CIG	Computerized Interactive Graphics
CIR	Cost Information Reports
CM	Configuration Management
CMI	Computer-Managed Instruction
CNI	Communications, Navigation, and Identification
CO	Contracting Office, Contract Offices, or Change Order
COC	Certificate of Competency (administered by the Small Business Administration)
COCO	Contractor-Owned, Contractor-Operated
CODSIA	Council of Defense and Space Industry Associations
COMSAT	Communications Satellite Corporation
CONUS	CONtinental United States
COP	Capability Objective Package
COTR	Contracting Officer's Technical Representative
CP	Communications Processor
CPAF	Cost-Plus-Award-Fee Contract
CPFF	Cost-Plus-Fixed-Fee Contract
CPIF	Cost-Plus-Incentive-Fee Contract
CPR	Cost Performance Reports
CPSR	Contractor Procurement System Review
CR	Cost Reimbursement (Cost plus Contract)
CSA	Combat or Computer Systems Architecture
C/SCSC	Cost/Schedule Control System Criteria (also called "C-Spec")
CWAS	Contractor Weighted Average Share in Cost Risk
DAL	Data Accession List
DAR	Defense Acquisition Regulations
DARPA	Defense Advanced Research Projects Agency
DAS	Data Acquisition System
DBHS	Data Base Handling System

DCA	Defense Communications Agency
DCAA	Defense Contract Audit Agency
DCAS	Defense Contract Administration Services
DCASR	DCAS Region
DCC	Digital Control Computer
DCP	Development Concept Paper (DoD)
DCS	Defense Communications System
DCTN	Defense Commercial Telecommunications Network
DDA	Dynamic Demand Assessment (Delta Modulation)
DDC	Defense Documentation Center
DDL	Digital Data Link - A segment of a communications network used for data transmission in digital form
DDN	Defense Data Network
DDS	Dynamic Diagnostics System
DECCO	DEfense Commercial Communications Office
DECEO	DEfense Communications Engineering Office
D&F	Determination and Findings - required documentation for approval of a negotiated procurement
DIA	Defense Intelligence Agency
DIF	Document Interchange Format, Navy-sponsored word processing standard
DHHS	Department of Health and Human Services
DIDS	Defense Integrated Data Systems
DISC	Defense Industrial Supply Center
DLA	Defense Logistics Agency
DMA	Defense Mapping Agency
DNA	Defense Nuclear Agency
DO	Delivery Order
DOA	Department of Agriculture (also USDA)
DOC	Department of Commerce
DOE	Department of Energy
DOI	Department of Interior
DOJ	Department of Justice
DOS	Department of State
DOT	Department of Transportation
DPA	Delegation of Procurement Authority (granted by GSA under FRPs)
DPC	Defense Procurement Circular
DQ	Definite Quantity Contract
DQ/PL	Definite Quantity Price List Contract
DR	Deficiency Report
DSCS	Defense Satellite Communication System
DSN	Defense Switched Network
DSP	Defense Support Program (WWMCCS)
DSS	Defense Supply Service
DTC	Design-to-Cost

ECP	Engineering Change Proposal
ED	Department of Education
EEO	Equal Employment Opportunity
8(a) Set-Aside	Agency awards direct to Small Business Administration for direct placement with a socially/economically disadvantaged company
EMC	Electro-Magnetic Compatibility
EMCS	Energy Monitoring and Control System
EO	Executive Order - Order issued by the President
EOQ	Economic Ordering Quantity
EPA	Environmental Protection Agency
EPMR	Estimated Peak Monthly Requirement
EPS	Emergency Procurement Service (GSA) or Emergency Power System
EUC	End User Computing, especially in DoD
FA	Formal Advertising
FAC	Facility Contract
FAR	Federal Acquisition Regulations
FCA	Functional Configuration Audit
FCC	Federal Communications Commission
FCDC	Federal Contract Data Center
FCRC	Federal Contract Research Center
FDPC	Federal Data Processing Center
FEDSIM	Federal (Computer) Simulation Center (GSA)
FEMA	Federal Emergency Management Agency
FFP	Firm Fixed-Price Contract (also Lump Sum Contract)
FIPS	NBS Federal Information Processing Standard
FIPS PUBs	FIPS Publications
FIRMR	Federal Information Resource Management Regulations
FMS	Foreign Military Sales
FOC	Final Operating Capability
FOIA	Freedom of Information Act
FP	Fixed-Price Contract
FP-L/H	Fixed-Price - Labor/Hour Contract
FP-LOE	Fixed-Price - Level-of-Effort Contract
FPMR	Federal Property Management Regulations
FPR	Federal Procurement Regulations
FSC	Federal Supply Classification
FSG	Federal Supply Group
FSN	Federal Supply Number
FSS	Federal Supply Schedule or Federal Supply Service (GSA)
FSTS	A revolving fund, designated as the Federal Telecommunications Fund, used by GSA to pay for GSA-provided common-user services, specifically including the current FTS and proposed FTS 2000 services

FTSP	Federal Telecommunications Standards Program administered by NCS; Standards are published by GSA.
FTS	Federal Telecommunications System
FTS 2000	Proposed Replacement for the Federal Telecommunications System
FY	Fiscal Year
FYDP	Five-Year Defense Plan
GAO	General Accounting Office
GFE	Government-Furnished Equipment
GFM	Government-Furnished Material
GFY	Government Fiscal Year (October to September)
GIDEP	Government-Industry Data Exchange Program
GOCO	Government-Owned/Contractor-Operated
GOGO	Government-Owned/Government-Operated
GOSIP	Government Open Systems Interconnection Profile
GPO	Government Printing Office
GPS	Global Positioning System
GRH	Gramm-Rudman-Hollings Act (1985), also called Gramm-Rudman Deficit Control
GS	General Schedule
GSA	General Services Administration
GSBCA	General Services Administration Board of Contract Appeals
HCFA	Health Care Financial Administration
HHS	(Department of) Health and Human Services
HPA	Head of Procuring Activity
HSDP	High-Speed Data Processors
HUD	(Department of) Housing and Urban Development
ICA	Independent Cost Analysis
ICAM	Integrated Computer-Aided Manufacturing
ICE	Independent Cost Estimate
ICP	Inventory Control Point
ICST	Institute for Computer Sciences and Technology, National Bureau of Standards, Department of Commerce
IDAMS	Image Display and Manipulation System
IDEP	Interservice Data Exchange Program
IDN	Integrated Data Network
IFB	Invitation for Bids
IOC	Initial Operating Instructions
IOI	Internal Operating Instructions
IPS	Integrated Procurement System
IQ	Indefinite Quantity Contract
IR&D	Independent Research & Development
IRM	Information Resources Management
IXS	Information Exchange System

JFMIP	Joint Financial Management Improvement Program
JOCIT	Jovial Compiler Implementation Tool
JSIPS	Joint Systems Integration Planning Staff
JSOP	Joint Strategic Objectives Plan
JSOR	Joint Service Operational Requirement
JUMPS	Joint Uniform Military Pay System
LC	Letter Contract
LCC	Life Cycle Costing
LCMP	Life Cycle Management Procedures (DD7920.1)
LCMS	Life Cycle Management System
L-H	Labor-Hour Contract
LOI	Letter of Interest
LRPE	Long-Range Procurement Estimate
LRIRP	Long-Range Information Resource Plan
MAISRC	Major Automated Information Systems Review Council (DoD)
MANTECH	MANufacturing TECHnology
MAPS	Multiple Address Processing System
MAP/TOP	Manufacturing Automation Protocol/Technical and Office Protocol
MASC	Multiple Award Schedule Contract
MDA	Multiplexed Data Accumulator
MENS	Mission Element Need Statement or Mission Essential Need Statement (see DD-5000.1 Major Systems Acquisition)
MILSCAP	Military Standard Contract Administration Procedures
MIL SPEC	Military Specification
MIL STD	Military Standard
MIPR	Military Interdepartmental Purchase Request
MOD	Modification
MOL	Maximum Ordering Limit (Federal Supply Service)
MPC	Military Procurement Code
MYP	Multi-Year Procurement
NARDIC	Navy Research and Development Information Center
NASA	National Aeronautics and Space Administration
NBS	National Bureau of Standards
NCMA	National Contract Management Association
NCS	National Communications System; responsible for setting U.S. Government standards administered by GSA; also holds primary responsibility for emergency communications planning
NICRAD	Navy-Industry Cooperative Research and Development
NIP	Notice of Intent to Purchase
NMCS	National Military Command System
NSA	National Security Agency

NSEP	National Security and Emergency Preparedness
NSF	National Science Foundation
NSIA	National Security Industrial Association
NTIA	National Telecommunications and Information Administration of the Department of Commerce; replaced the Office of Telecommunications Policy in 1970 as planner and coordinator for government communication programs; primarily responsible for radio
NTIS	National Technical Information Service
Obligation	“Earmarking” of specific funding for a contract from committed agency funds
OCS	Office of Contract Settlement
OFCC	Office of Federal Contract Compliance
Off-Site	Services to be provided near, but not in, government facilities
OFMP	Office of Federal Management Policy (GSA)
OFPP	Office of Federal Procurement Policy
OIRM	Office of Information Resources Management
O&M	Operations & Maintenance
OMB	Office of Management and Budget
O,M&R	Operations, Maintenance and Readiness
On-Site	Services to be performed on a government installation or in a specified building
OPM	Office of Procurement Management (GSA) or Office of Personnel Management
Options	Source-source additions to the base contract for services or goods to be exercised at the government’s discretion
OSHA	Occupational Safety and Health Act
OSI	Open System Interconnect
OSP	Offshore Procurement
OTA	Office of Technology Assessment (Congress)
Out-Year	Proposed funding for fiscal years beyond the Budget Year (next fiscal year)
P-I	FY Defense Production Budget
P3I	Pre-Planned Product Improvement (program in DoD)
PAR	Procurement Authorization Request or Procurement Action Report
PAS	Pre-Award Survey
PASS	Procurement Automated Source System
PCO	Procurement Contracting officer
PDA	Principal Development Agency
PDM	Program Decision Memorandum
PDR	Preliminary Design Reporting
PIR	Procurement Information Reporting
PME	Performance Monitoring Equipment

PMP	Purchase Management Plan
PO	Purchase Order or Program Office
POM	Program Objective Memorandum
POSIX	Portable Open System Interconnection Exchange
POTS	Purchase of Telephone Systems
PPBS	Planning, Programming, Budgeting System
PR	Purchase Request or Procurement Requisition
PRA	Paperwork Reduction Act
PS	Performance Specification - alternative to a Statement of Work, when work to be performed can be clearly specified
QA	Quality Assurance
QAO	Quality Assurance Office
QMCS	Quality Monitoring and Control System (DoD software)
QMR	Qualitative Material Requirement (Army)
QPL	Qualified Products List
QRC	Quick Reaction Capability
QRI	Quick Reaction Inquiry
R-I	FY Defense RDT&E Budget
RAM	Reliability, Availability, and Maintainability
RC	Requirements Contract
R&D	Research and Development
RDA	Research, Development and Acquisition
RDD	Required Delivery Date
RD&E	Research, Development and Engineering
RDF	Rapid Deployment Force
RDT&E	Research, Development, Test and Engineering
RFI	Request for Information
RFP	Request for Proposal
RFQ	Request for Quotation
RFTP	Request for Technical Proposals (Two-Step)
ROC	Required Operational Capability
ROI	Return on Investment
RTAS	Real Time Analysis System
RTDS	Real Time Display System
SA	Supplemental Agreement
SBA	Small Business Administration
SB Set-Aside	Small Business Set-Aside contract opportunities with bidders limited to certified small businesses
SCA	Service Contract Act (1964 as amended)
SCN	Specification Change Notice
SDN	Secure Data Network
SEC	Securities and Exchange Commission
SE&I	Systems Engineering and Integration

SETA	Systems Engineering/Technical Assistance
SETS	Systems Engineering/Technical Support
SIBAC	Simplified Intragovernmental Billing and Collection System
SIMP	Systems Integration Master Plan
SIOP	Single Integrated Operations Plan
SNAP	Shipboard Nontactical ADP Program
Sole Source	Contract award without competition
Solicitation	Invitation to submit a bid
SOR	Specific Operational Requirement
SOR	Statement of Work
SSA	Source Selection Authority (DoD)
SSAC	Source Selection Advisory Council
SSEB	Source Selection Evaluation Board
SSO	Source Selection Official (NASA)
STINFO	Scientific and Technical INFOrmation Program - Air Force/NASA
STU	Secure Telephone Unit
SWO	Stop-Work Order
Synopsis	Brief description of contract opportunity in CBD after D&F and before release of solicitation
TA/AS	Technical Assistance/Analysis Services
TCP/IP	Transmission Control Protocol/Internet Protocol
TEMPEST	Studies, inspections, and tests of unintentional electromagnetic radiation from computer, communication, command and control equipment that may cause unauthorized disclosure of information; usually applied to DoD and security agency testing programs
TILO	Technical and Industrial Liaison Office - Qualified Requirement Information Program - Army
TM	Time and Materials contract
TOA	Total Obligational Authority (Defense)
TOD	Technical Objective Document
TR	Temporary Regulation (added to FPR, FAR)
TRACE	Total Risk Assessing Cost Estimate
TRCO	Technical Representative of the Contracting offices
TREAS	Department of Treasury
TRP	Technical Resources Plan
TSP	GSA's Teleprocessing Services Program
TVA	Tennessee Valley Authority
UCAS	Uniform Cost Accounting System
USA	U.S. Army
USAF	U.S. Air Force
USCG	U.S. Coast Guard
USMC	U.S. Marine Corps
USN	U.S. Navy

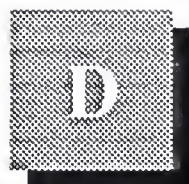
U.S.C.	United States Code
USPS	United States Postal Service
USRRB	United States Railroad Retirement Board
VA	Veterans Affairs Department
VE	Value Engineering
VHSIC	Very High-Speed Integrated Circuits
VIABLE	Vertical Installation Automation Baseline (Army)
VICI	Voice Input Code Identifier
WBS	Work Breakdown Structure
WGM	Weighted Guidelines Method
WIN	WWMCCS Intercomputer Network
WITS	Washington Interagency Telecommunications System
WIS	WWMCCS Information Systems
WS	Work Statement - Offerer's description of the work to be done (proposal or contract)
WWMCCS	World-Wide Military Command and Control System

B**General and Industry Acronyms**

ADAPSO	Association of Data Processing Service Organization, now the Computer Software and Services Industry Association
ADP	Automatic Data Processing
ADPE	Automatic Data Processing Equipment
ANSI	American National Standards Institute
BOC	Bell Operating Company
CAD	Computer-Aided Design
CAM	Computer-Aided Manufacturing
CBEMA	Computer and Business Equipment Manufacturers Association
CCIA	Computers and Communications Industry Association
CCITT	Comite Consultatif Internationale de Telegraphique et Telephonique; Committee of the International Telecommunication Union
COBOL	Common Business-Oriented Language
COS	Corporation for Open Systems
CPU	Central Processing Unit
DBMS	Data Base Management System
DRAM	Dynamic Random Access Memory

EIA	Electronic Industries Association
ISDN	Integrated Services Digital Networks
ISO	International Organization for Standardization; voluntary international standards organization and member of CCITT
ITU	International Telecommunications Union
LSI	Large-Scale Integration
MFJ	Modified Final Judgment
PROM	Programmable Read-Only Memory
RBOC	Regional Bell Operating Company
UNIX	AT&T Proprietary Operating System
UPS	Uninterruptible Power Source
VAR	Value-Added Reseller
VLSI	Very Large-Scale Integration
WORM	Write-Once-Read-Many-Times

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Appendix: Policies, Regulations, and Standards

A

OMB Circulars

A-11	Preparation and Submission of Budget Estimates
A-49	User of Management and Operating Contracts
A-71	Responsibilities for the Administration and Management of Automatic Data Processing Activities
A-76	Policies for Acquiring Commercial or Industrial Products and Services Needed by the Government
A-109	Major Systems Acquisitions
A-120	Guidelines for the Use of Consulting Services
A-121	Cost Accounting, Cost Recovery, and Integrated Sharing of Data Processing Facilities
A-123	Internal Control Systems
A-127	Financial Management Systems
A-130	Management of Federal Information Resources
A-131	Value Engineering

B

GSA Publications

The FIRMR, as published by GSA, is the primary regulation for use by federal agencies in the management, acquisition, and use of both ADP and telecommunications information resources.

C

DoD Directives

DD-5000.1	Major System Acquisitions
DD-5000.2	Major System Acquisition Process

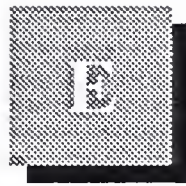
DD-5000.11	DoD Data Elements and Data Codes Standardization Program
DD-5000.31	Interim List of DoD-Approved High-Order Languages
DD-5000.35	Defense Acquisition Regulatory Systems
DD-5200.1	DoD Information Security Program
DD-5200.28	Security Requirements for Automatic Data Processing (ADP) Systems
DD-5200.28-M	Manual of Techniques and Procedures for Implementing, Deactivating, Testing, and Evaluating Secure Resource Sharing ADP Systems
DD-7920.1	Life Cycle Management of Automated Information (AIS)
DD-7920.2	Major Automated Information Systems Approval Process
DD-7935	Automated Data Systems (ADS) Documentation

D

Standards

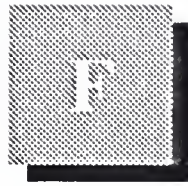
ADCCP	Advanced Data Communications Control Procedures; ANSI Standard X3.66 of 1979; also NBS FIPS 71
CCITT G.711	International PCM standard
CCITT T.0	International standard for classification of facsimile apparatus for document transmission over telephone-type circuits
DEA-1	Proposed ISO standard for data encryption based on the NBS DES
EIA RS-170	Monochrome video standard
EIA RS-170A	Color video standard
EIA RS-464	EIA PBX standards
EIA RS-465	Standard for Group III facsimile
EIA RS-466	Facsimile standard; procedures for document transmission in the General Switched Telephone Network
EIA RS-232-C	EIA DCE to DTE interface standard using a 25-Pin connector; similar to CCITT V-24
EIA RS-449	New EIA standard DTE to DCE interface which replaces RS-232-C
FED-STD 1000	Proposed Federal Standard for adoption of the full OSI reference model
FED-STD 1026	Federal Data Encryption Standard (DES) adopted in 1983; also FIPS-46
FED-STD 1041	Equivalent to FIPS-100

FED-STD 1061	Group II Facsimile Standard (1981)
FED-STD 1062	Federal standard for Group III facsimile; equivalent to EIA RS-465
FED-STD 1063	Federal facsimile standard; equivalent to EIA RS-466
FED-STDs 1005, 1005A-1008	Federal Standards for DCE Coding and Modulation
FIPS 46	NBS Data Encryption Standard (DES)
FIPS 81	DES Modes of Operation
FIPS 100	NBS Standard for packet-switched networks; subset of 1980 CCITT X.25
FIPS 107	NBS Standard for local-area network; similar to IEEE 802.2 and 802.3
FIPS 146	Government Open Systems Interconnection (OSI) Profile (GOSIP)
FIPS 151	NIST POSIX (Portable Operating System Interface for UNIX) standard
IEEE 802.2	OSI-Compatible IEEE standard for data-link control in local-area networks
IEEE 802.3	Local-area network standard similar to Ethernet
IEEE 802.4	OSI-compatible standard for token-bus local-area networks
IEEE 802.5	Local-area networks standard for token-ring networks
IEEE P1003.1	POSIX standard, similar to FIPS 151
MIL-STD-188-114C	Physical interface protocol similar to RS-232 and RS-449
MIL-STD-1777	IP-Internet Protocol
MIL-STD-1778	TCP - Transmission Control Protocol
MIL-STD-1780	File Transfer Protocol
MIL-STD-1781	Simple Mail Transfer Protocol (electronic mail)
MIL-STD-1782	TELNET - virtual terminal protocol
MIL-STD-1815A	Ada Programming Language Standard
SVID	UNIX System Interface Definition
X.12	ANSI Standard for Electronic Data Interchange
X.21	CCITT Standard for interface between DTE and DCE for synchronous operation on public data networks
X.25	CCITT standard for interface between DTE and DCE for terminals operating in the packet mode on public data networks
X.75	CCITT standard for links that interface different packet networks
X.400	ISO application-level standard for the electronic transfer of messages (electronic mail)



Appendix: Related INPUT Reports

- *Federal Geographic Information Systems, 1991-1996*
- *Federal Computer Equipment Market, 1991-1996*
- *Federal Systems Integration Market, 1990-1995*
- *Federal Professional Services Market, 1990-1995*
- *U.S. Application Solutions Market, 1991-1996*
- *U.S. UNIX Market, 1989-1994*
- *U.S. Systems Integration Market, 1990-1995*
- *Electronic Image Processing, 1990-1995*



Appendix: Agency/User Questionnaire

Study Title: Federal Electronic Imaging Market, 1991-1996

Interview Type: User

Date: _____

Interviewer: _____

This questionnaire is directed towards the federal government's acquisition and use of electronic imaging systems, including software, hardware, and professional services.

Respondent Name: _____

Title: _____

Department: _____

Agency: _____

Address: _____

Phone: _____

Hello, my name is _____. I'm with a market research firm called INPUT. We are currently conducting a study of the federal electronic imaging market. Are you the correct person to speak with regarding the use of imaging systems within your organization?

(If yes, continue)

(If no) Who might be a better point of contact within your agency?

Do you have about ten minutes to answer a few questions for our study?

This questionnaire is divided into three sections:

Part I addresses agency past buying trends and currently-installed systems.

Part II addresses agency buying intentions.

Part III addresses agency opinions and perceptions of the federal market for electronic imaging systems.

I. Agency Current Environment

1. Has your organization implemented any major information processing applications that include the storage and retrieval of electronic images?

_____ Yes

_____ No (Go to Question 5)

2. Please briefly describe the application(s):

3. Did your organization develop and implement the system with internal resources, or was it developed by a systems integrator, or through some other approach?

_____ Did ourselves

_____ Systems integrator (Who? _____)

_____ Other approach (Describe)

4. On what hardware platform does your imaging system(s) run?

Supercomputer _____ Workstation _____

Mainframe _____ Microcomputer _____

Minicomputer _____

II. Agency Buying Intentions

5. Are you considering purchasing an imaging system in the FY 1991-FY 1996 timeframe?

_____ Yes

_____ No (If answer to Question 1 was "no" also, close interview.
If answer to Question 1 was "yes", go to Question 8.)

6. For what application(s)?

7. How much do you expect your agency to spend on imaging in the following fiscal years?

FY 1991	_____	FY 1994	_____
FY 1992	_____	FY 1995	_____
FY 1993	_____	FY 1996	_____

III. Agency Perceptions

8. On a scale of 1-5 (5 being most important), rate the following factors for system justification:

_____ Personnel savings

_____ Savings on storage media (e.g., magnetic disk)

_____ Space savings (facilities, filing, shelves, etc.)

_____ Improved records management

_____ Improved customer service

_____ Other (identify)

9. On a scale of 1-5 (5 being most important), rate the following selection criteria:

_____ Software features

_____ Vendor's federal experience

_____ Ease of implementation

_____ Vendor's support reputation

_____ Product price

_____ Equipment reputation

_____ Other (identify)

10. Do you have a preference for the type of vendor you would choose to provide an imaging system to your organization?

_____ Yes

_____ No

(If yes, check preference)

_____ Hardware vendor

_____ Professional services firm

_____ Software vendor

_____ Systems integrator

_____ Manufacturer

_____ Other

11. On a scale of 1-5 (5 being most preferred), rate the following methods for acquiring imaging systems:

_____ Requirements contract

_____ GSA schedule

_____ RFP

_____ Excess equipment

_____ Other (describe)

12. Is your organization implementing or using imaging standards?

_____ Yes

_____ No (Go to Question 14)

13a. What standards are you using?

13b. How are imaging standards being developed for your agency?

_____ Agency in-house

_____ Interagency groups

_____ Using vendor-developed standards

_____ Combination (specify)

14. Is the existence or nonexistence of imaging standards affecting your agency's desire to purchase or implement imaging systems?

_____ Yes

_____ No

(If yes) How?

15. Is the controversy over whether document images are legal substitutes for original hard copy documents hindering your agency from purchasing or implementing an imaging system?

_____ Yes

_____ No

16. In your opinion, is the growing population of imaging causing a reduction of activity in paper-related technology?

_____ Yes

_____ No

17. In your opinion, what companies are leaders in the federal imaging market?
